Operation, Installation & Service Manual

SSL & SSIL Series Sight Glass Hopper Loaders

Important! **Please Read Carefully Before Attempting to Install or Operate Equipment!**

882.00149.00 **CV1-600.3**

Write down your hopper _____ _____

loader serial numbers _____ _____

here for future reference _____ _____

_____ _____

Performance figures stated in this manual are based on a standard atmosphere of 59°F (15°C) at 29.92” Hg (1,014 millibars) at sea level, using 60 Hz power. Altitude is an important consideration when specifying hopper loaders. ACS can advise you on proper selection and sizing of systems for your operating environment.

ACS is committed to a continuing program of product improvement. Specifications, appearance, and dimensions described in this manual are subject to change without notice.

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Shipping Information

Unpacking and Inspection

You should inspect your SSL or SSIL hopper loader for possible shipping damage. If the container and packing materials are in reusable condition, save them for reshipment if necessary.

Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware and mounting screws, etc. In case of breakage, damage, shortage, or incorrect shipment, refer to the following sections.

In the Event of Shipping Damages

Important!

According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment.

- ☑ Notify the transportation company's local agent if you discover damage.
- ☑ Hold the damaged goods and packing material for the examining agent's inspection. **Do not return any goods to the manufacturer before the transportation company inspection and authorization**.
- ☑ File a claim against the transportation company. Substantiate the claim by referring to the agent's report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.
- ☑ Advise the manufacturer regarding your wish for assistance and to obtain an RMA (return material authorization) number.

Parcel Post Shipment

- ☑ Notify the manufacturer at once in writing, giving details of the loss or damage. This information is required for filing a claim with our insurance company.
- ☑ Hold the damaged goods with the container and packing materials for possible inspection by postal authorities.

United Parcel Service Shipment

- ☑ Contact your local UPS office regarding damage and insurance claims.
- ☑ Retain the container and packing.
- ☑ Notify the manufacturer at once.

If the Shipment is Not Complete

Check the packing list. The apparent shortage may be intentional. Back-ordered items are noted on the packing list. You should have:

- ☑ SSL Series or SSIL Series hopper loader(s) with controller(s)
- ☑ Bill of lading
- ☑ Packing list
- ☑ Operating and Installation packet
- ☑ Electrical schematic and panel layout drawings
- ☑ Component instruction manuals

Re-inspect the container and packing material to see if you missed any smaller items during unpacking. Determine that the item was not inadvertently taken from the area before you checked in the shipment. Notify the manufacturer immediately of the shortage.

If the Shipment is Not Correct

If the shipment is not what you ordered, **contact the parts and service department immediately** at (262) 641-8610. Have the order number and item number available. *Hold the items until you receive shipping instructions*.

Returns

Important!

Do not return any damaged or incorrect items until you receive shipping instructions from the manufacturer.

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Chapter 1: Safety

SSL Series hopper loaders and SSIL Series sight glass hopper loaders are designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes.

To avoid possible personnel injury or equipment damage when installing, operating, or maintaining this equipment, use good judgment and follow these safe practices:

- ☑ Follow all **SAFETY CODES**.
- ☑ Wear **SAFETY GLASSES** and **WORK GLOVES**.
- ☑ Disconnect and/or lock out power before servicing or maintaining the hopper loader.
- ☑ Use care when **LOADING**, **UNLOADING**, **RIGGING**, or **MOVING** this equipment.
- ☑ Operate this equipment within design specifications.
- ☑ **OPEN**, **TAG**, and **LOCK ALL DISCONNECTS** before working on equipment. You should remove the fuses and carry them with you.
- ☑ Make sure the hopper loader and components are properly **GROUNDED** before you switch on power.
- ☑ Do not jump or bypass any electrical safety control.
- ☑ Do not restore power until you remove all tools, test equipment, etc., and the hopper loader and related equipment are fully reassembled.
- ☑ Only **PROPERLY TRAINED** personnel familiar with the information in this manual should work on this equipment.

Chapter 2: Functional Description

2-1 Introduction

SS Series hopper loaders economically and efficiently load free-flowing pellets or granular materials from supply containers into machine bins or other receivers. They are a modular, stainless steel component design using significant operational advantages. Their engineered construction permits easier cleaning and maintenance, and they can be quickly and easily reconfigured to accommodate future production requirements. Simple electrical and compressed air connections are all that's needed for operation; central vacuum systems are not necessary.

SSL Series hopper loaders use an integral-mount three-stage centrifugal motor with a quick-disconnect plug power cord. The hopper-mounted junction box is pre-wired to the field-mounted 115/1/60 control box. The SSL Series features a high-flow blowback valve to enhance cleaning its acrylic/mesh flat filter, providing excellent filtration of conveying air.

SSIL Series sight glass hopper loaders have the features of the SSL Series hopper loader, but include a high-visibility Pyrex™ sight glass for easy monitoring of material load/ discharge cycles. The sight glass assembly is equipped with an adjustable proximity sensor to ensure full material discharge on each cycle. Like the SSL Series hopper loader, SSIL Series hopper loaders feature a quick-release design; no tools are needed to remove the hopper cover or the sight glass.

2-2 Necessary Documents

The items listed here are required for installation, operation, and maintenance of SS Series hopper loaders. Additional copies are available from the manufacturer.

- This product manual.
- Product manuals for accessories and options selected by the customer, where installed.

2-3 Equipment Function

SS Series hopper loaders are efficient conveyers of free-flowing pelletized or granular materials from supply containers into machine bins or other receivers. You can customize operation by adjusting operating parameters accessible through a menu system built into the control. Simple electrical and compressed air connections are all that's needed for operation; a central vacuum system is not necessary.

2-4 Models Covered in this Manual

SS Series models are designated by volume and if the unit has the sight glass feature, designated with **IL**. **SSL06** models are hopper loaders with 0.2 cu. ft. (5.6 liter) capacity; **SSIL11** models are sight glass hopper loaders with a sight glass capacity of 0.09 cu. ft. (2.55 liters) and a hopper capacity of 0.4 cu. ft. (11.3 liters); see Figures 2 and 4 for more information on capacities.

SS/CS Series models are available in 0.1, 0.2, 0.4, 0.8 and 1.6 cu. ft. (2.8, 5.6, 11.3, 22 and 45 liter) capacities, with or without the 0.09 cu. ft. (2.55 liter) sight glass feature.

SSL Series	Capacity			
	Cu. ft.	Liters	Lbs.	Kg
SSL/CSL 03	0.1	2.8	3.5	1.5
SSL/CSL 06	0.2	5.6	7.0	3.1
SSL/CSL 11	0.4	11.3	14.0	6.3
SSL/CSL 23	0.8	22	28	12.7
SSL/CSL 45	1.6	45	56	25.4

SSIL Series	Capacity				Sight Glass Capacity	
	Cu. ft.	Liters	Lbs.	Kg	Cu. ft (l)	Lbs. (Kg)
SSIL/CSIL 03	0.1	2.8	3.5	1.5	0.02 (0.57)	0.68 (0.31)
SSIL/CSIL 06	0.2	5.6	7.0	3.1	0.09 (2.55)	3.25 (1.48)
SSIL/CSIL 11	0.4	11.3	14.0	6.3	0.09 (2.55)	3.25 (1.48)

.

2-5 Standard Operational Features

SSL/CSL Series Hopper Loaders

- Brushed stainless steel construction with stainless steel product contact surfaces
- ⅜" (about 9.5 mm) high flow blowback valve with electrical quick disconnect and accumulator
- 1½" OD (about 38.1 mm OD) material inlet

- Removable inlets on 0.2, 0.4, 0.8, and 1.6 cu. ft. (5.6, 11.3, 22 and 45 liter) models only
- Glazed polyester reinforced flat filter
- Hopper-mounted junction box with 12 feet (3.6 m) of cable to a field-mounted 115/1/60 control box
- Material demand/level sensor
- Series One Plus models include a proximity level sensor for volume filling, built-in proportioning, and a batch counter; SPV available **separately**
- High-performance centrifugal motor with electrical quick disconnect
- 9-foot (2.7 m) power cord
- Aluminum pickup wand with ten (10) feet (3 m) of flexible vinyl hose and two (2) hose clamps
- SSL06, SSL11, SSL23 and SSL45 include a counter-weighted type flapper and accumulator blowback for improved filter cleaning.

SSIL Series Sight Glass Hopper Loaders

- **Pyrex™ 0.02 cu. ft. (0.57 liter) or 0.09 cu. ft. (2.55 liter) sight glass. (The SSIL 03 uses the smaller sight glass and the SSIL 06 and SSIL 11 use the larger size).**
- Brushed stainless steel construction, with stainless steel product contact surfaces
- High-performance centrifugal motor
- ⅜" (about 9.5 mm) high flow blowback valve with electrical quick disconnect and accumulator
- Glazed polyester reinforced flat filter
- Aluminum pickup wand with ten (10) feet (3 m) of flexible vinyl hose and two (2) hose clamps
- Minimum inventory on molding machine
- 9-foot (2.7 m) power cord
- 4" (101.6 mm) square flange on 0.1 cu. ft. (2.8 liter) model
- 7" (177.8 mm) square flange on 0.2 and 0.4 cu. ft. (5.6 and 11.3 liter) models
- 1½" OD (about 38.1 mm OD) material inlet
- Hopper capacities of 0.1, 0.2, and 0.4 cu. ft. (2.8, 5.6, and 11.3 liters); side outlet

- Hopper-mounted junction box with 12 feet (3.6 m) of cable to a field-mounted 115/1/60 control box
- Removable inlets on 0.2 and 0.4 cu. ft. (5.6 and 11.3 liter) models
- Accumulator blowback is standard on 0.2 and 0.4 (5.6 and 11.3 liter) models **only**
- Series One Plus models (option upgrade) include a proximity level sensor for volume filling, built-in proportioning, control capacity, and a no-convey alarm

Note: *The Series One Plus controller option upgrade is required for remote proportioning valve (SPV) operation;* ***SPV is sold separately.***

2-6 Available Options

Special Voltages

Models are also available in 230/1/50 VAC and 230/1/60 VAC voltages.

Series One Plus Controller

The Series One Plus controller is a sensor-driven volume-fill cycle controller with available proportioning outputs. It permits operator programming of blowback pulses for optimum operating efficiency. It keeps an accurate count of up to 9,999 batches, even in the event of a power failure, and the controller includes a No Fill alarm to notify the operator of an empty gaylord or lack of material flow.

Remote Proportioning Valve

The remote proportioning valve (SPV) option lets you economically and efficiently proportion two (2) different free-flowing granulated materials in a material conveying system. The most common application is mixing virgin and regrind materials in a plastic processing operation. SPV installation options include a wall-mount bracket and floor stand.

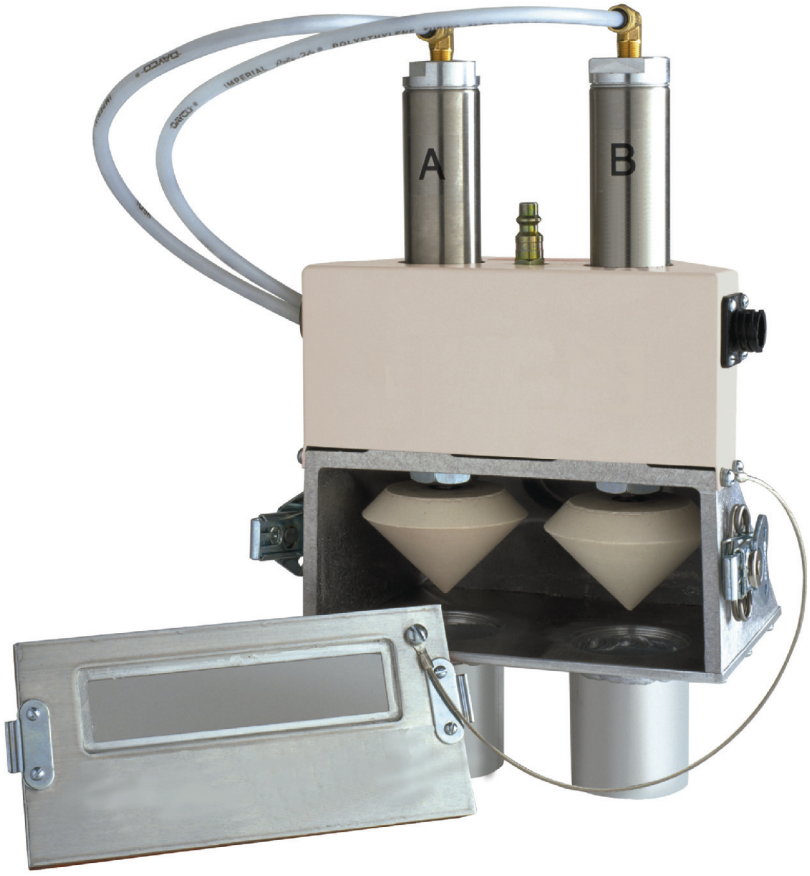
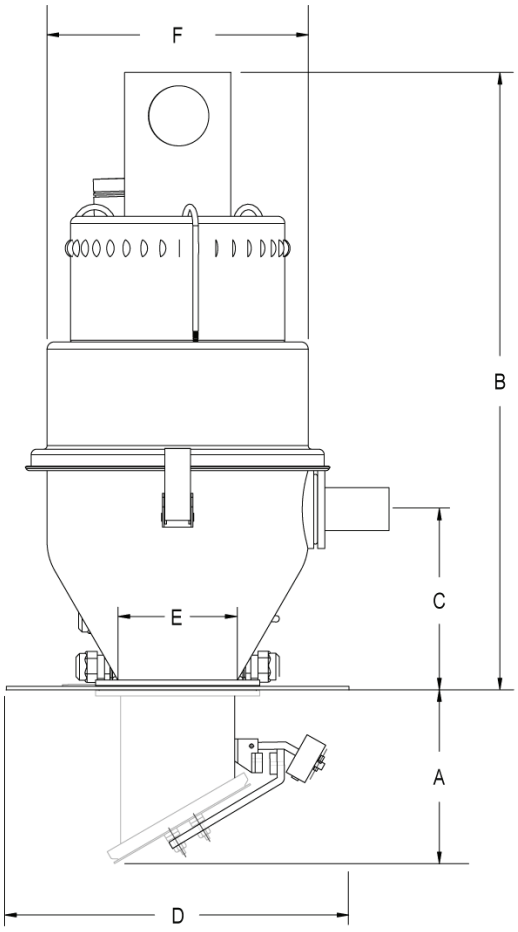


Figure 1: Typical SSL Series Hopper Loader



- **10” Clearance Cutout with (6) ¼” bolt holes equally spaced on an 11” circle.**

SSL03 Hopper Loader

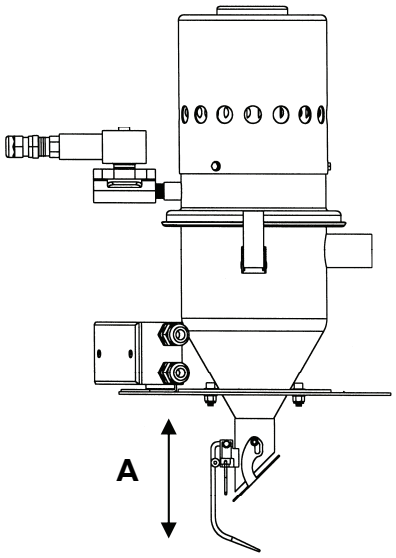


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Figure 3:
SSL Series Dimensions, Specifications, and Maximum Machine-Side Throughput

American Standards

Capacity	Dimensions in inches					
cu. ft.	A	B	C	D	E	F
0.1	7.0	17 3/8"	6 3/8"	12"	1 3/4"	6 3/8"
0.2	5.75	21 1/8"	5 1/2"	12"	4"	9 1/8"
0.4		27 1/8"	11 1/2"	12"	4"	9 1/8"
0.8		30 ¼"	10 ½"	12"	4"	14 1/8"
1.6		36 ½"	17 ¾"	12"	4"	14 1/8"

Metric Standards

Capacity	Dimensions in cm					
liters	A	B	C	D	E	F
2.8	17.8	44.1	16.2	30.5	4.4	16.2
5.6	14.6	53.7	14.0	30.5	10.1	23.2
11.3		68.9	29.2	30.5	10.1	23.2
22		77	27	12	10.1	36
45		93	45	12	10.1	36

① 5/16"/0.313" (8.0 mm) -diameter holes; two (2) places equally spaced.
② 5/16"/0.313" (8.0 mm) -diameter holes; four (4) places equally spaced.
③ 1/4"/0.250" (6.3 mm) -diameter holes; six (6) places equally spaced;
J *is standard mounting hole pattern.*

SSL Series Specifications

Model	Hopper capacity				Full-load amps	Inlet size range		Shipping weight	
no.	cu. ft.	liters	lbs.	Kg	(FLA)	inches	*mm*	lbs.	Kg
SSL03	0.1	2.8	3.5	1.5	11	1½"	*38 mm*	47	*22*
SSL06	0.2	5.6	7.0	3.1	11	1½"	*38 mm*	65	*30*
SSL11	0.4	11.3	14.0	6.3	11	1½"	*38 mm*	67	*31*
SSL23	0.8	22	28	12.7	10	1 ½"	*38 mm*	75	*34*
SSL45	1.6	45	56	25.4	10	1 ½"	*38 mm*	80	*36*

SSL Series Maximum Machine-Side Throughput

Twelve (12) -foot (3.66 m) vertical 1½" OD (approx. 38 mm) flex hose; pellets @ 35 lbs./cu. ft. (560 Kg/cu. m)

Model	Non-Proportioning ①		Proportioning	
number	lbs./hr.	Kg/hr.	lbs./hr.	Kg/hr.
SSL03	150	68	Not available	
SSL06	500	227	400	182
SSL11	1,000	454	800	364
SSL23	1,500	680	1,200	544
SSL45	1,700	771	1,350	612

① Maximum throughput beside-the-press loading; includes 12-foot (3.6 m) vertical lift.
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Figure 4: Typical SSIL Series Sight Glass Hopper Loader

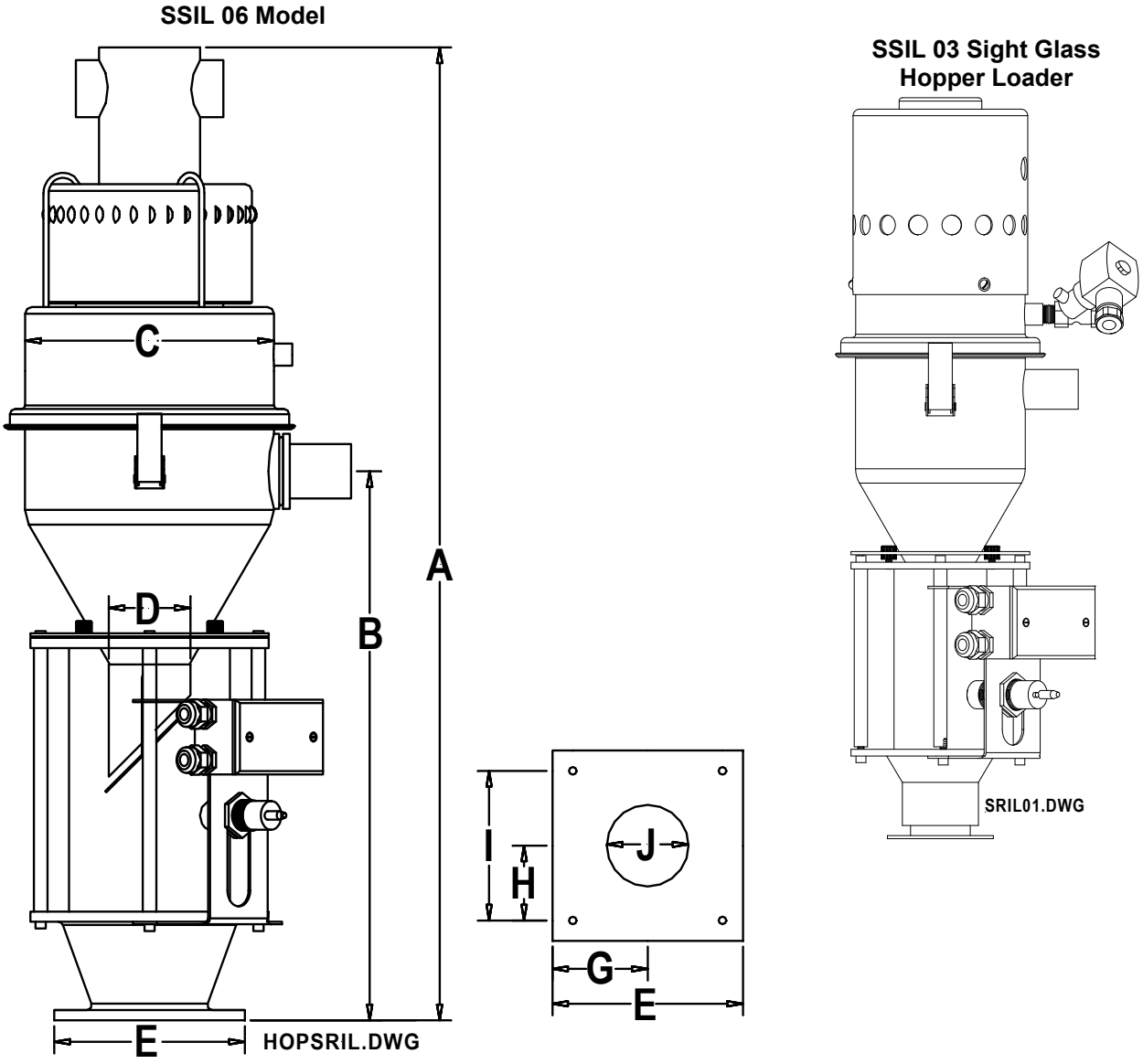

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Figure 5:
SSIL Series Dimensions, Specifications, and Maximum Machine-Side Throughput

American Standards

Capacity	Dimensions in inches								
cu. ft.	A	B	C	D	E -sq.	G -sq.	H -sq.	I -sq. ①	J
0.1	27⅝"	17"	6⅜"	1¾"	4"	2"	1¼"	2½"	2"
0.2	35¼"	19½"	9⅛"	3"	7"	3½"	2¾"	5½"	3"
0.4	41¼"	25¾"	9⅛"	3"	7"	3½"	2¾"	5½"	3"

Metric Standards

Capacity	Dimensions in *cm*								
liters	A	B	C	D	E -sq.	G -sq.	H -sq.	I -sq. ①	J
2.8	74.0	41.9	16.2	4.4	10.2	5.1	3.2	6.3	5.1
5.6	89.5	49.5	23.2	7.6	17.8	8.9	7.0	14.0	7.6
11.3	104.8	65.4	23.2	7.6	17.8	8.9	7.0	14.0	7.6

① 0.281" (7.1 mm) -diameter holes; four (4) places equally spaced.

SSIL/CSIL Series Specifications

Selection								Model no.	Full-load amps	Specifications					
Hopper capacity				Sight glass capacity						Inlet/outlet range		Square mounting flange dimensions		Shipping weight	
cu. ft.	*liters*	lbs.	*Kg*	cu. ft.	*liters*	lbs.	*Kg*		FLA	inches	*mm*	inches	*mm*	lbs.	*Kg*
0.1	*2.8*	3.5	*1.5*	0.02	*0.57*	0.68	*0.31*	SSIL/ CSIL03	11	1½"	*38 mm*	4"	*101.6*	50	*23*
0.2	*5.6*	7.0	*3.1*	0.09	*2.55*	3.25	*1.48*	SSIL/ CSIL06	11	1½"	*38 mm*	7"	*177.8*	70	*32*
0.4	*11.3*	14.0	*6.3*	0.09	*2.55*	3.25	*1.48*	SSIL/ CSIL11	11	1½"	*38 mm*	7"	*177.8*	72	*33*

SSIL/CSIL Series Maximum Machine-Side Throughput

Twelve (12) -foot (3.66 m) vertical 1½" OD (approx. 38 mm) flex hose; pellets @ 35 lbs./cu. ft. (560 Kg/cu. m)

Model number	Non-Proportioning ①		Proportioning	
	lbs./hr.	Kg/hr.	lbs./hr.	Kg/hr.
SSIL/CSIL03	150	68	Not available	
SSIL/CSIL06	500	227	400	182
SSIL/CSIL11	1,000	454	800	364

① Maximum throughput beside-the-press loading; includes 12-foot (3.6 m) vertical lift.

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Chapter 3: Installation

3-1 Work Rules

Install, operate, and maintain this equipment according to all applicable work and safety codes. This includes, but is not limited to: OSHA, NEC, CSA, and any other local, national, and international regulations. Obey these specific work rules:

- ☑ Read and follow these instructions when installing, operating and maintaining this equipment. If the instructions become lost or unreadable, obtain a new copy from the manufacturer.
- ☑ Only qualified persons should work on or with this equipment.
- ☑ Work only with approved tools and devices.
- ☑ Disconnect and lock out electric power before maintaining or servicing a hopper loader. If the unit is installed with a power cord that can be unplugged, unplug it. If the unit is permanently wired to a power main, have a fused power disconnect, capable of being locked in the **OFF** position, installed.

3-2 Safety Considerations

- ☑ Connect the hopper loader to a grounded three-prong power receptacle. If this is not possible, ground the hopper loader motor for electrical isolation and protection from electric shock.
- ☑ Do not use hopper loaders in explosive atmospheres.
- ☑ Do not use outdoors or in wet environments. Moisture damages the motor and can create an electric shock hazard.
- ☑ Operate hopper loaders at the rated voltage. Operation at other than design voltage can result in, at best, poor performance, and can cause damage to the vacuum motor, control, and personnel.

3-3 Necessary Tools

- ☑ Hand drill
- ☑ Pop-rivet gun
- ☑ $^{3}/_{16}$" (about 4.8 mm) -diameter rivets

3-4 Mounting SSL/CSL and SSIL/CSIL Hopper Loaders

You can mount your SSL/CSL or SSIL/CSIL hopper loader directly to the processing machine by cutting a hole in the machine bin lid and fastening the hopper loader to it. The hopper loader mounting flange mates with the equipment and uses the same mounting holes as previous models.

For new installations or mounting on other manufacturer's equipment, a hole location template is included in the information packet.

Important!

We are not responsible for equipment damage from excessive processing machine vibrations.

3-5 Mounting Tips

- Run a bead of silicone sealant around the mounting flange before seating the hopper loader. This provides an additional seal.
- Use **rivets** to mount the hopper loader. Bolts, nuts, and washers can loosen, fall into, and damage process equipment.
- Check across the mounting flange with a bubble level. Level installation ensures proper material discharge valve operation.
- Install controller boxes to a non-moving solid structure to avoid loosening any wiring from vibration.
- Remove all rubber banding and any other packaging materials from around the flapper dump valve **before** installation for proper operation.

3-6 Attaching the Pickup Wand

Slide the flex hose onto the material inlet and pickup wand. Use the hose clamps supplied to secure the flex hose. The flex hose should not cover the aeration holes on the pickup wand.

The pickup wand needs no adjustment for most applications. Insert it into the material to be conveyed and it will work.

Some applications require a more defined air-to-material ratio. Cover one or more of the holes at the top of the pickup wand.

3-7 Making Compressed Air Connections

Your SSL/CSL or SSIL/CSIL hopper loader requires a clean, dry, 80 to 120 psi (551.6 to 827.4 kPa/5.52 to 8.27 bars) compressed air supply. A filter, regulator, and shutoff valve are recommended components of your in-plant compressed air supply.

You may need to install an accumulator in your air supply system to enhance blowback effectiveness if your system cannot consistently meet these requirements. Make sure you use full-sized $^{3}/_{8}$"-diameter pipe or tubing when making connections.

3-8 Making Electrical Connections

The controller you selected is shipped pre-wired to the SSL/CSL or SSIL/CSIL Series hopper loader. Units are supplied with a power cord with plug wired to the control unit, ready to plug into an appropriately grounded three-prong receptacle.

Make sure that the material demand sensor is installed with the proper amount of clearance, and that it is free of obstructions.

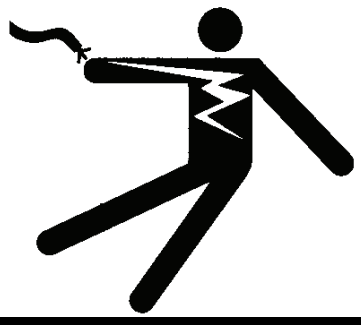
If the installation has the SSL/CSL or SSIL/CSIL Series hopper loader wired directly to a power main, you must install a fused disconnect with lockout to allow safe operation and maintenance. **Make sure all connections are *tight*.**

3-9 Installing the Remote Control Box

Optional-Series One Plus Controller Only

The remote option permits mounting a control up to 9 feet (2.75 m) from the primary control box. Both controls remain operational.

! WARNING



HAZARDOUS ELECTRICAL CURRENT PRESENT.

To avoid burn or electrocution hazard, disconnect electrical power *before* installing this option!

1. Install the SSL/CSL or SSIL/CSIL Series hopper loader.
2. Select a location for the remote box and mount it securely.
3. Plug the cable supplied into the 25-pin receptacle on the hopper loader controller. Route the cable to the remote box so it doesn't interfere with processing operations. Observe all applicable electrical codes.
4. Connect the cable to the receptacle on the remote control enclosure.

   Both controls are now fully operational.

   - Main power supervision is available on the hopper-mounted control only.

3-10 Adjusting the Proximity Switch

SSIL/CSIL Series Sight Glass Loaders with Series One Plus Controllers Only

The proximity switch, mounted through the side of the hopper loader tank, senses when the hopper loader is full. It is factory-set to sense most conveyed materials accurately, and

provides volume-fill control. When the hopper loader is full, the LED on the proximity switch should light and trigger the dump sequence.

If the switch does not reliably sense the material you are conveying, adjust switch sensitivity. Turn the potentiometer (or *pot*) clockwise to increase sensitivity, counterclockwise to decrease sensitivity.

Chapter 4: Series One Controller Operation

4-1 Pre-Startup Checklist

- ☑ Are all electrical connections correct, secure, and to code?
- ☑ Is the compressed air connection secure and safe?
- ☑ Is the hopper level and mounted securely?
- ☑ Are the flex hose and pick-up wand secure?
- ☑ **Can the material level switch activate without obstruction?**
- ☑ **Can the material discharge valve swing without obstruction?**

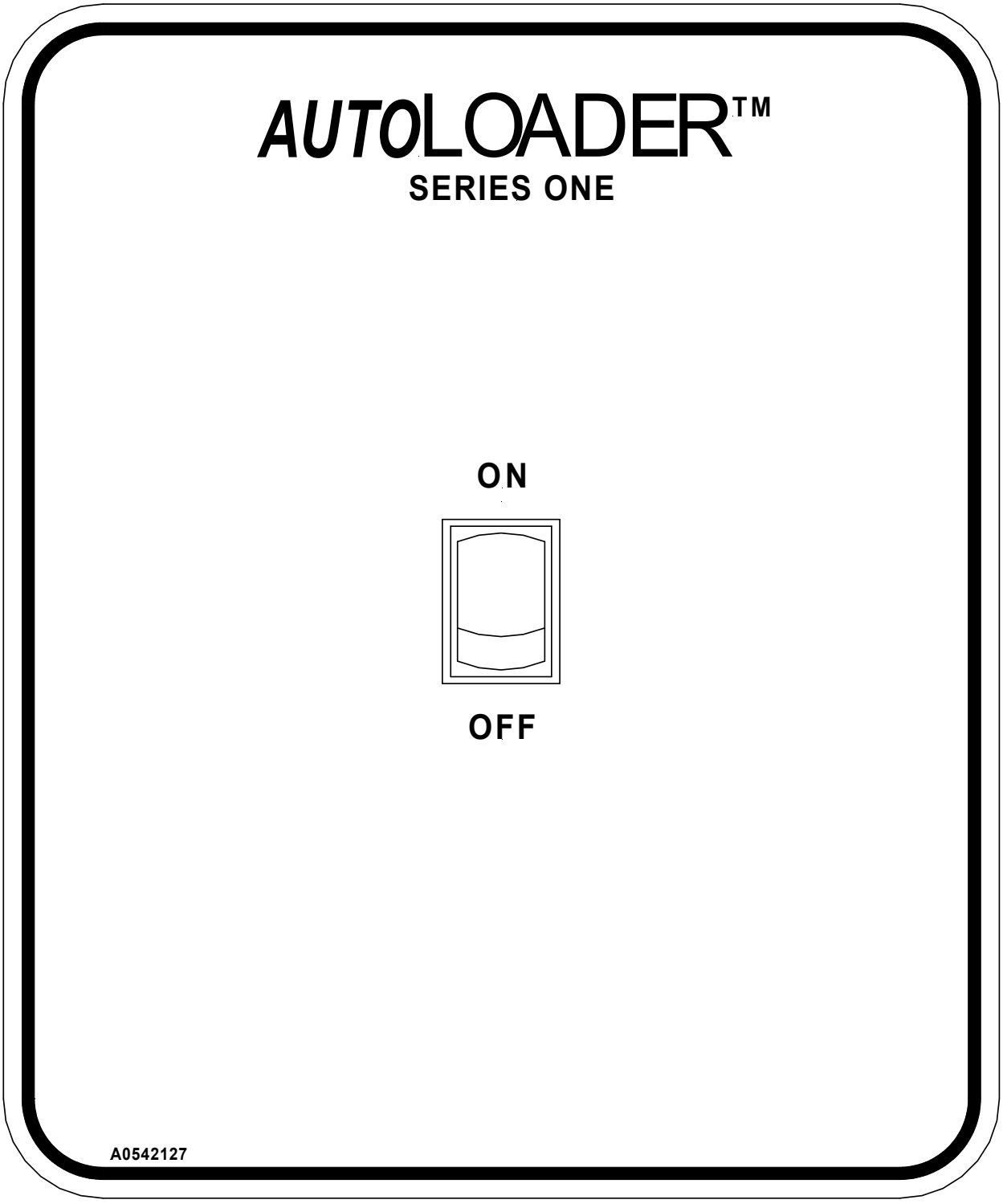
4-2 Operating Sequence

1. Blowback sequence.
2. Motor starts.
3. Flapper discharge valve seals under vacuum.
4. Material conveys.
5. Hopper loader hopper fills.
6. Vacuum timer times out.
7. Motor stops.
8. Blowback sequence begins, the flapper discharge valve opens under the weight, and material dumps.

   Steps 1 through 8 repeat automatically.

If the level switch remains open, the hopper loader remains idle until the material level in the bin drops and frees the counterbalanced dump valve. Steps 1 through 8 in the loading sequence as listed above then resumes automatically.

Figure 6: Series One Graphic Panel



4-3 Starting the Hopper Loader

1. Insert the pickup probe into the material supply.
2. Turn on compressed air to the unit.
3. Plug in power to the control enclosure.
4. Move the power switch on the Series One graphic panel to the **ON** position.

4-4 Changing the Conveying Sequence

! DANGER

DISCONNECT POWER *BEFORE* OPENING THE CONTROL BOX.

Electric current, *CAPABLE OF CAUSING INJURY OR DEATH*, MAY BE PRESENT in the controller enclosure during these procedures.

The adjustments listed in this section must be performed *ONLY* by a qualified, safety-conscious technician.

The Series One controller is a time-fill mode controller, and has sixteen (16) loading sequences to select. **Make sure you avoid over-filling the hopper!** Figures 7 and 8 list loading times and number of blowback pulses in each sequence. **Use the chart as your model;** select a sequence that suits your needs.

To select a sequence (see Figures 7 and 8 on the following pages):

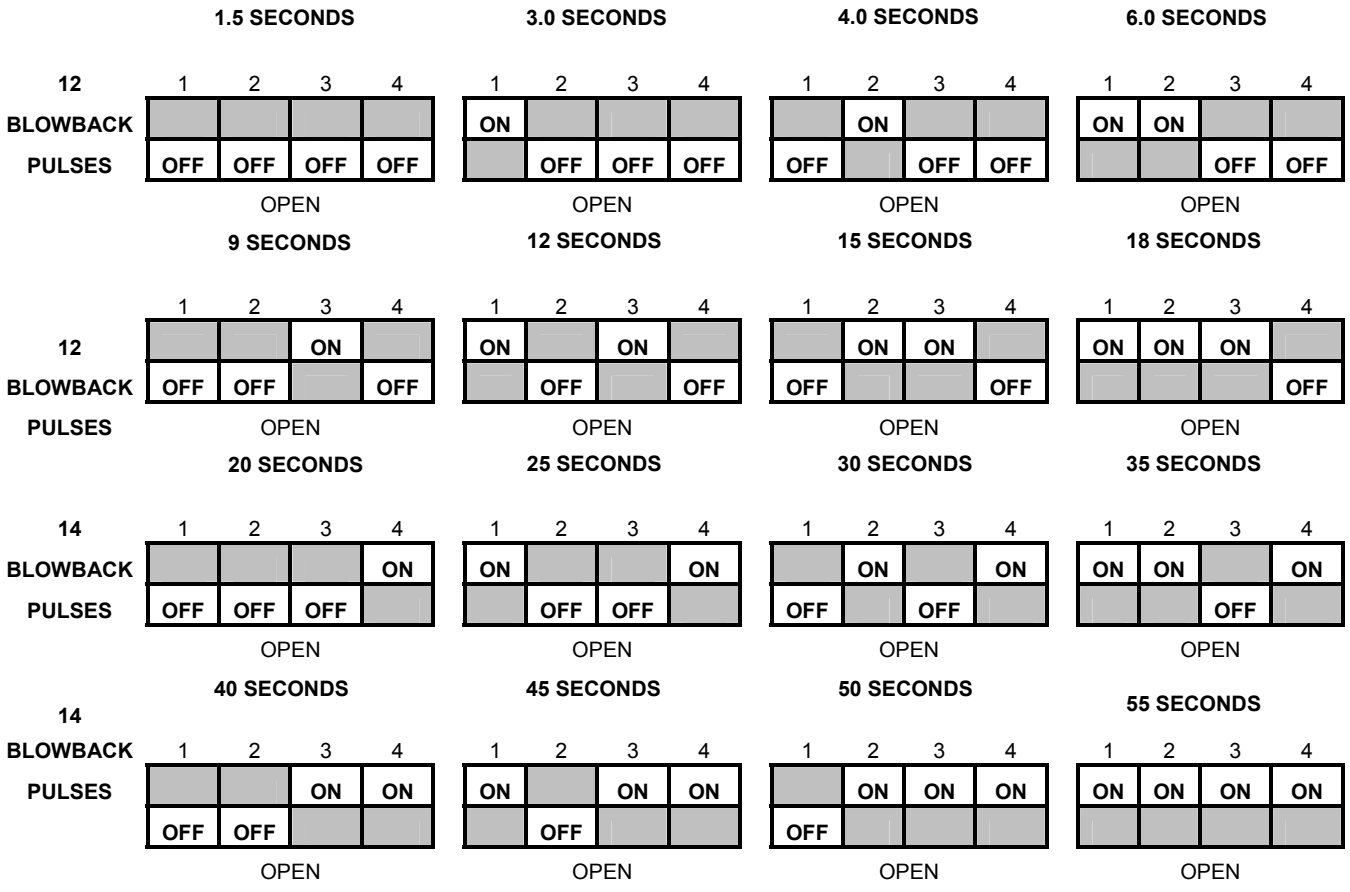
1. Turn off and disconnect power to the unit.
2. Remove the controller box cover.
3. Move the DIP switches on the DIP switch array labeled **SW1** to one of the sixteen (16) available configurations as shown in Figure 8.
4. Replace the controller box cover.
5. Reconnect power to the Series 1 controller and prepare the unit for operation.

4-5 Selecting the Most Efficient Loading Sequence

By selecting the best sequence, you can reduce vacuum motor wear, save energy, and reduce your need to maintain filters.

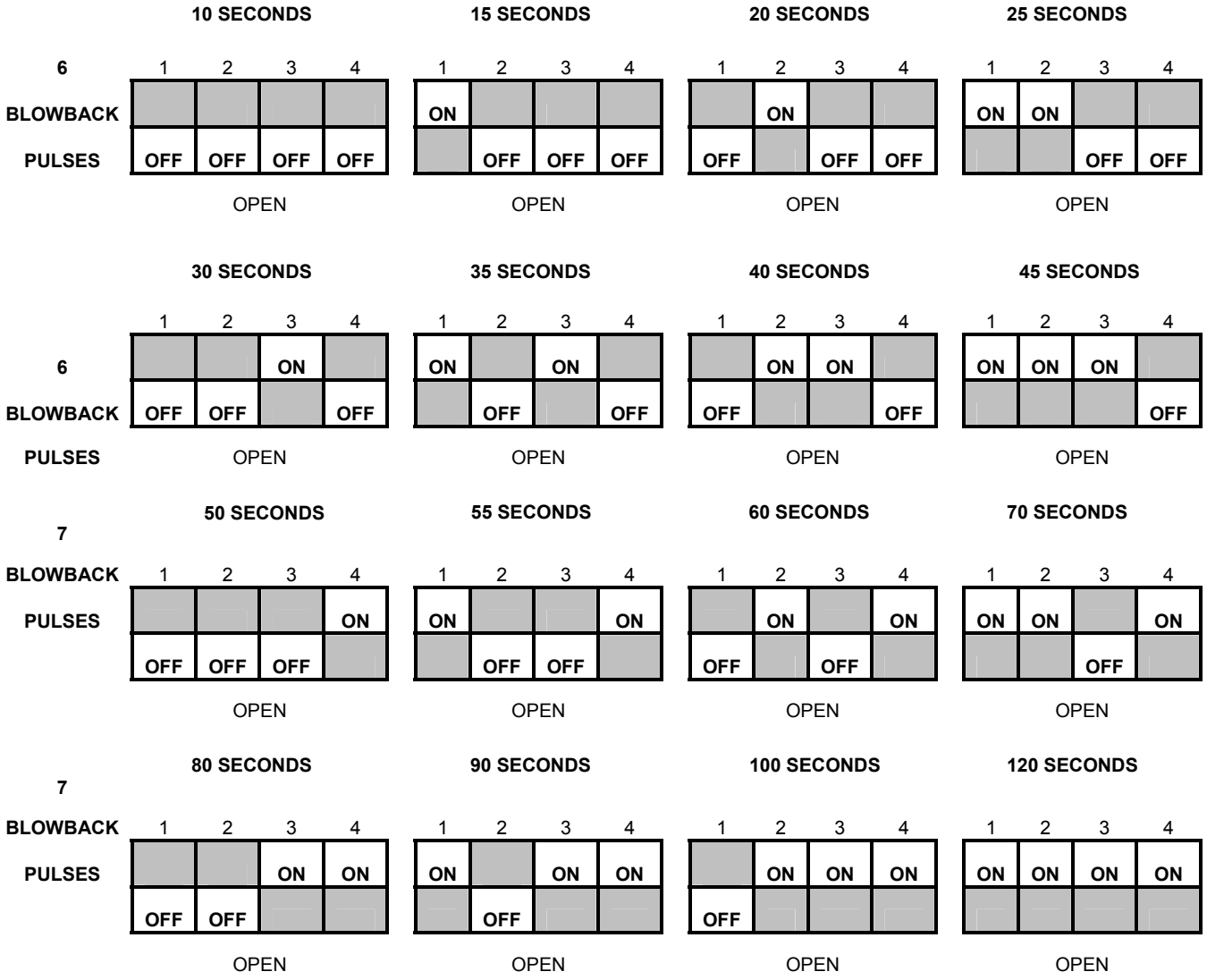
1. Begin with a sequence time longer than what is required for your process.
2. Start up the hopper loader with the Series One controller.
3. Observe the flex hose and the material in which you buried the pickup probe. Listen to the vacuum motor and the sound that the material makes as it enters the hopper loader.
4. When the hopper loader is full, the conveying rate drops off sharply. You can observe this condition in the clear flex hose and the material container in which you buried the pickup probe. When the hopper loader is full, the vacuum motor and material sounds also change.
5. Make a note of the elapsed time from the start of conveying to the time the hopper loader is full.
6. See Figures 7 and 8; pick the next-shorter sequence. For example, if the hopper is full by the 90-second point of the conveying sequence, select the 80-second conveying sequence.

Figure 7: Conveying Dip Switch Chart, Program A0541578
SSL/CSL 03 and SSIL/CSIL03 Models



Note: Figure 7 contains two (2) different programs (12 and 14 blowback pulses)

Figure 8: Conveying Dip Switch Chart, Program A0536814
SSL/CSL 06, 11, 23 and 45 and SSIL/CSIL 06 and 11 Models



Note: Figure 9 contains two (2) different programs (6 and 7 blowback pulses).

4-6 Shutting Down the Hopper Loader Using the Series One Controller

- Move the power switch on the Series One graphic panel to the **OFF** position. For maintenance or for a long-term shutdown, **unplug the unit from the power source** and shut off the compressed air supply.

-Notes-

Chapter 5: Series One Plus Controller Operation

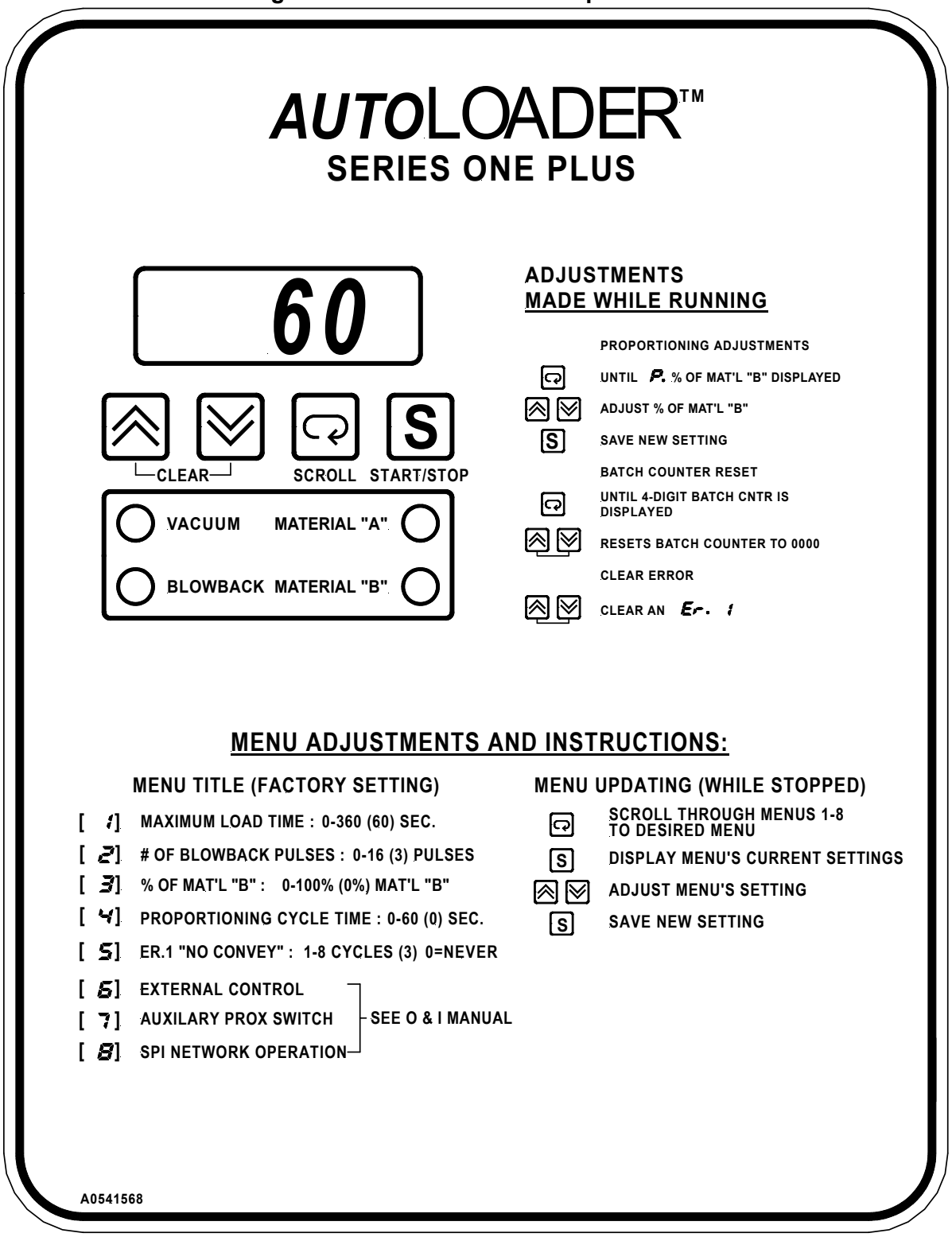
The Series One Plus controller is an **optional** controller that includes the following features:

- Sensor-driven volume fill cycle to assure full load discharge for each cycle
- Operator programming of blowback pulses to optimize efficiency
- Accurate fill cycle counts up to 9,999 on the batch counter to assist in estimating material usage
- No Fill alarm with automatic shutdown notifies the operator of an empty material source or lack of material flow; saves motor brushes and reduces maintenance
- Proportioning capability

5-1 Pre-Startup Checklist

- ☑ Are all electrical connections correct, secure, and to code?
- ☑ Is the compressed air connection secure and safe?
- ☑ Is the hopper level and mounted securely?
- ☑ Are the flex hose and pick-up wand secure?
- ☑ **Can the material discharge valve swing without obstruction?**

Figure 9: Series One Plus Graphic Panel



5-2 Operating Sequence

1. Blowback sequence.
2. Motor starts.
3. The flapper discharge valve seals under vacuum.
4. Material conveys.
5. Hopper loader hopper fills.
6. Vacuum timer times out.
7. Motor stops.
8. Blowback sequence begins, the flapper discharge valve opens under the weight, and material dumps.

   Steps 1 through 8 repeat automatically.

If the level switch remains open, the hopper loader remains idle until the material level in the bin drops and frees the discharge valve. Steps 1 through 8 in the loading sequence listed here resume automatically.

5-3 Series One Plus Controls and Displays

Series One Plus Controller Keys

UP Key

Press the **UP** key to increment up parameter values.

DOWN Key

Press the **DOWN** key to decrement down parameter values.

UP Key and DOWN Key—Press Together

Press the **UP** key and **DOWN** key together simultaneously while turning on power to reset to factory default values.

SCROLL Key

Press the **SCROLL** key to display:

- available menus when the controller is in Standby mode.
- operations screens such as batch counter and SPV settings when the controller is operating.

START/STOP/SELECT/SET Key

Press the **START/STOP/SELECT/SET** key to:

- start the hopper loader
- stop the hopper loader
- select parameters from menu screens
- set parameters

Series One Plus Controller Indicators

LED Screen

The red LED screen is a four-character alphanumeric display. It displays system statuses, menus, and variable values for operating the hopper loader.

VACUUM Indicator

The **VACUUM** indicator lights when the unit is in Vacuum mode.

MATERIAL “A” Indicator

The **MATERIAL “A”** indicator lights when the Material A port is open.

BLOWBACK Indicator

The **BLOWBACK** indicator lights when the air solenoid is open.

MATERIAL "B" Indicator

The **MATERIAL "B"** indicator lights when the Material B port is open.

5-4 Starting Up the Hopper Loader for the First Time Using the Series One Plus Controller

Non-Proportioning Models

1. Insert the pickup wand into the material supply.
2. Turn on the compressed air to the hopper loader.
3. Apply power to the controller.

Note: *Press **and hold** the* ***UP** key and **DOWN** key together simultaneously while applying power to restore all factory defaults.*

As the controller powers up, the screen displays in succession:

- ***PLUS*** for three seconds
- the software version number ***n.nn***
- the standby mode display.

4. Press the **START/STOP/SELECT/SET** key to start the hopper loader.

   The vacuum motor conveys material until the proximity sensor indicates the hopper loader is full or the factory-pre-set default maximum vacuum time of sixty seconds passes, whichever comes first. The **VACUUM** and **MATERIAL "A"** LEDs light and the LED display shows the elapsed conveying time.

Note: You can adjust the maximum vacuum time from 0 to 360 seconds. See Section 5-11, Menu 1.

When the proximity sensor trips or sixty (60) seconds elapses, the vacuum motor shuts off for three (3) seconds to relieve vacuum in the hopper and to allow the material to dump.

The **BLOWBACK** LED flashes and the screen displays **----** as a four (4) -pulse blowback cycle occurs.

Note: You can adjust number of blowback pulses from 0 to 16 pulses. See Section 5-11, Menu 2.

The conveying cycle repeats automatically until the Bin Full switch senses that the material receiver (machine hopper) is full. The hopper loader stops in Standby mode and the screen displays ***FULL*** until the machine bin level drops and automatic operation resumes.

Notes:

- If the Series One Plus screen displays the ***Er. 1*** No Convey error code and shuts down after three (3) conveying cycles, but you do not have a material supply problem, then you need to lengthen the maximum vacuum time to fill the hopper sufficiently to trigger the proximity sensor. See Section 5-11, Menu 1.

- The maximum number of consecutive unsuccessful conveying cycles before an alarm condition occurs is adjustable from 0 to 8 cycles. See Section 5-11, Menu 5.

First Time Startup for Proportioning Models

1. Insert the pickup wand into the material supply.
2. Turn on the compressed air to the hopper loader.
3. Apply power to the controller.

Note: Press **and hold** the CLEAR **UP** key and **DOWN** key together simultaneously while applying power to restore all factory defaults.

As the controller powers up, the screen displays in succession:

- ***PLUS*** for three seconds
- the software version number *n.nn*
- the standby mode display.

4. Press the SCROLL **SCROLL** key repeatedly until the screen displays ***3***, the percentage of Material B menu.
5. Press the START/STOP **START/STOP/SELECT/SET** key to select this menu.
6. Press the **UP** key to increase the percentage of material B; press the **DOWN** key to decrease the % of material B.
7. When the screen displays the percentage of Material B you want, press the START/STOP **START/STOP/SELECT/SET** key to set that value.
8. Press the START/STOP **START/STOP/SELECT/SET** key to start the hopper loader.

   The **Vacuum** LED lights and the vacuum motor conveys material until the proximity sensor indicates the hopper loader is full or sixty seconds passes, whichever comes first.

   The LED display shows the elapsed conveying time.

Note: You can adjust the maximum vacuum time from 0 to 360 seconds. See Section 5-11, Menu 1.

The **MATERIAL "A"** and **MATERIAL "B"** LEDs alternate on and off as set in Steps 4 to 6 above. This indicates the proportioning valve cycle.

Example: If the percent of Material B was set at 50% in Step 4, the **MATERIAL "A"** and **MATERIAL "B"** LEDs alternate **ON** for ten second periods; this equals 50% of the factory-default thirty (30) -second proportioning cycle.

Note: The proportioning SPV total cycle time is adjustable; see Section 5-11, Menu 4 for more information. *This time is not the same as total vacuum time.* To see the relationship between these two time parameters, see Figure 10, Proportioning Cycle.

When the proximity sensor trips or sixty (60) seconds elapses, the vacuum motor shuts off for three (3) seconds to relieve vacuum in the hopper and to allow the material to dump.

The **BLOWBACK** LED flashes and the screen displays **----** as a four-(4) -pulse blowback cycle occurs.

Note: You can adjust number of blowback pulses from 0 to 16 pulses. See Section 5-11, Menu 2.

The conveying cycle repeats automatically until the Bin Full switch senses that the material receiver (machine hopper) is full. The hopper loader stops in Standby mode and the screen displays ***FULL*** until the machine bin level drops and automatic operation resumes.

5-5 Operating a Hopper Loader at Factory Defaults

Series One Plus Controller Models

The Series One Plus controller factory-set defaults are suitable for most conveying requirements.

Install your SS/CS Series hopper loader, apply power, press the **START/STOP** key and operation begins. The hopper loader loads itself until full, then dumps and repeats, pausing only when the machine bin below it is full.

The screen displays the vacuum timer while the vacuum motor is on. If the hopper loader is a **PP** proportioning model, follow the instructions in Section 5-6 below.

Stop your hopper loader at any time by pressing the **START/STOP** key.

5-6 Operating the Proportioning Feature

Series One Plus Models Only

The proportioning feature allows layering of two materials in the machine bin below the hopper loader. Install the hopper loader and put both the material pickup wands in the material supply gaylords and follow the instructions that follow.

Adjusting Proportioning While the Hopper Loader is in Standby Mode

1. When the standby mode displays, press the **SCROLL** key until the Proportioning Menu displays as ***3***.
2. Press the **START/STOP/SELECT/SET** key to access Menu 3.

   The current percentage of Material B displays.
3. Press the **UP** key or the **DOWN** key to change the setting as needed.
4. When the percentage of Material B you want displays, press the **START/STOP/ SELECT/SET** key to set it.

   - or -

   Press the **SCROLL** key to leave the menu unchanged.

Adjusting Proportioning On the Fly During Operation

1. While the hopper loader is operating, press the SCROLL **SCROLL** key until the screen displays the percent of Material B as ***P. nn***.
2. Press the UP **UP** key or the DOWN **DOWN** key to change the value as needed.
3. When the percentage of Material B you want displays, press the S START/STOP **START/STOP/ SELECT/SET** key to set it.

   - or -

   Press the SCROLL **SCROLL** key to leave the menu unchanged.

   The screen then displays the Vacuum Timer menu.

Note: "On-the-fly" adjustments range between 1% and 99%. To set the percentage of Material B from 0% to 100%, stop the Series One Plus controller and reset proportioning while the unit is in Standby mode, as described in the previous section.

5-7 Using the Batch Counter

The Series One Plus controller features a batch counter you can view during operation. The batch counter provides a rough approximation of total material throughput.

Viewing the Batch Counter

While the hopper loader is operating and while the screen displays the vacuum timer display:

- Press the SCROLL **SCROLL** key until the screen displays the four-digit batch counter.

  The screen remains on the batch count display until you press the SCROLL **SCROLL** key again.

To return to the vacuum timer screen:

- Press the SCROLL **SCROLL** key again.

  The screen reverts to the vacuum timer display.

Resetting the Batch Counter

To reset the batch counter to zero (***0***):

- Press **and hold** both the CLEAR **UP** key and **DOWN** key together simultaneously any time the batch counter is displayed.

  The batch counter resets to zero (***0***) and the screen reverts to the vacuum timer display.

5-8 Operating in Single-Shot Mode

1. Disconnect the Bin Full reed switch sensor and, in its place, wire a normally closed proximity switch.
2. Install a proximity switch in the machine bin at the highest level you want the material to reach.
   - The Series One Plus controller fills the machine bin until material covers the proximity switch.
   - The screen displays ***FULL*** until the material level drops below the proximity switch.

   The hopper loader then resumes operation automatically.

5-9 Customizing Series One Plus Controller Operations

The full-feature control gives you complete control over the loading process. You can gain access to adjustable parameters by using the Series One Plus menu system as shown in Figure 9. You can then fine-tune hopper loader operation at this point to fit the exact requirements of your process as required.

5-10 Navigating Series One Plus Controller Menus

You'll always enter the menu system when the screen displays ***AEC*** on the controller screen.

This screen displays at startup before you press the **START/STOP/SELECT/SET** key to start the hopper loader, and displays again when you press the **START/STOP/SELECT/ SET** key to stop the hopper loader.

To enter the menu system:

- When the screen displays ***AEC***, press the **SCROLL** key to enter the menu system.

  The screen displays ***1***, for Menu 1.

- Press and hold the **SCROLL** key to scroll through the eight (8) menus.

If you scroll past a menu you want:

- Press and hold both the **DOWN** key and the **SCROLL** key together simultaneously to scroll backwards through the menus.

When the menu you want displays:

- Press the **START/STOP/SELECT/SET** key to gain access to the menu.

  The screen changes to display the current setting of the menu you selected.

To adjust the current menu parameter:

- Press the **UP** key or the **DOWN** key until the screen displays the parameter value you want.

- Press the S START/STOP **START/STOP/SELECT/SET** key.

  The new setting is stored in the battery-backed RAM memory.

If you decide that you don't want to modify the current setting of a parameter:

- Press the SCROLL **SCROLL** key to abort the change.

  The change is aborted and the ***AEC*** screen displays again.

To return all parameters to factory default values:

- Turn off the Series One Plus using the green power switch.

- Press **and hold** both the CLEAR **UP** key and **DOWN** key together simultaneously as you turn on the Series One Plus green power switch.

All menu parameters are restored to factory default values.

5-11 Series One Plus Operating Parameter Menus

Menu 1 *Maximum Vacuum Cycle Time*

0 to 360 Seconds, Default = 60 Seconds

For volume-fill operation, the **Maximum Vacuum Cycle Time** menu lets you **set the maximum vacuum motor time** during a conveying sequence. If the level sensor in the hopper loader does not detect a full loader when the time you set elapses, the vacuum motor stops and the loader dumps. Increase this time setting if it takes longer than sixty (60) seconds to fill the loader.

Note: To optimize operation, set the timer in this menu to approximately ten (10) seconds longer than the time it takes to fill the loader under your current conveying conditions.
To determine how long it takes to fill the loader, watch the timer count up during operation. When the display changes to **- - - -** (dashes), the loader is **full**. Add ten (10) seconds to the value displayed right before the display changes to **- - - -** (dashes).

For time-fill operation, more frequent loading cycles, or less material conveyed per cycle, you can set this parameter so the vacuum motor stops and the loader dumps before it is full. Set the timer as needed, and be sure to disable the alarm (Menu 5 set to zero [***0***]) to prevent tripping the No-Convey alarm ***Er.1***.

Menu 2 *Number of Blowback Pulses*

0 to 16 Pulses, Default = 4 Pulses

The Number of Blowback Pulses menu lets you:

- **control** the number of blowback pulses discharged from the compressed air solenoid during the hopper dump sequence
- **increase** the number of pulses if the material conveyed exhibits bridging problems or otherwise dumps slowly
- **decrease** the number of pulses to optimize the cycle time and increase throughput when conveying free-flowing material

Menu 3 *Percentage of Material B*

0 to 100 Percent, Default = 0 Percent

PP Models Only

The **Percentage of Material B** menu lets you increase or decrease the percentage of Material B in the proportioning cycle.

Menu 4 *SPV Total Cycle Time*

0 to 60 Seconds, Default = 30 Seconds

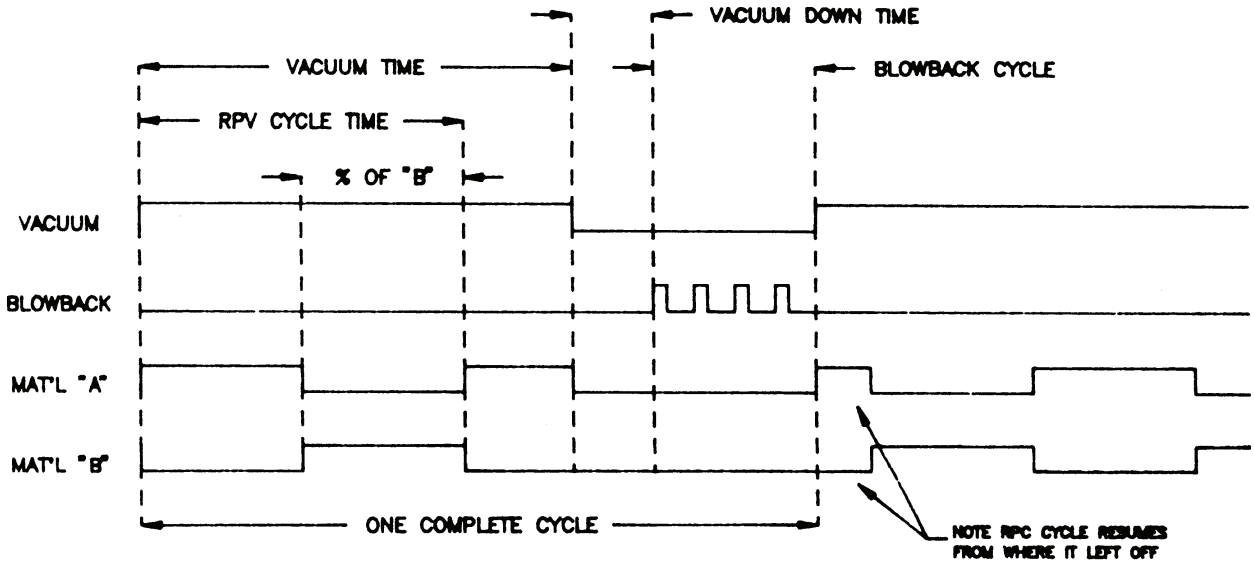
PP Models Only

The **SPV Total Cycle Time** menu lets you:

- **control** the duration of a complete proportioning cycle—this time is not the same as the vacuum time; the vacuum and proportioning timers operate concurrently as shown in Figure 10.
- **decrease** the SPV total cycle time to increase the layering of the two materials in the hopper loader as it fills
- **increase** the SPV total cycle time to reduce the layering of the two materials in the hopper loader as it fills

Example: If the percent of Material B (Menu ***3***) is set at 20% and the SPV total cycle time (Menu ***4***) is set at 40 seconds, Material B conveys for twenty percent (20%) of 40 seconds, or eight (8) seconds. Material A conveys for the remaining 32 seconds.

Figure 10: Proportioning Cycle


VACUUM DOWN TIME
VACUUM TIME
BLOWBACK CYCLE
RPV CYCLE TIME
% OF "B"
VACUUM
BLOWBACK
MAT'L "A"
MAT'L "B"
ONE COMPLETE CYCLE
NOTE RPC CYCLE RESUMES FROM WHERE IT LEFT OFF

Menu 5 *Error After n Cycles*

0 to 8 Cycles, Default = 3 Cycles

The **Error After n Cycles** menu lets you:

- **control** the number of unsuccessful loading cycle attempts (maximum vacuum timer times out and proximity sensor does not sense a full hopper) before the ***Er. 1*** error message displays
- **increase** to prevent alarms while you refill the material supply on high throughput processes
- **decrease** to get earlier warning of material supply problems
- **disable** (***0***) if you are using a short maximum vacuum time for less-than-full dumps

Menu 6 *External Activation*

Enable/Disable, Default = Disable (*0*)

The **External Activation** menu lets you:

- **enable or disable** recognition of the external system control contact
- **disable** for stand-alone operation
- **enable** if the hopper loader is in a central system and the external enable contact is in use

Menu 7 *Auxiliary Proximity Switch*

Enable/Low Bin Op/Ignore, Default = Ignore (*0*)

The Auxiliary Proximity Switch menu lets you:

- **enable** a customer-supplied auxiliary proximity switch (***2***)

  This proximity switch is typically mounted low in the machine bin below the hopper loader, and is wired into the hopper loader as shown in Figure (14). When enabled, if the proximity switch senses an empty machine bin, the screen displays the ***Er. 2*** error message and an optional alarm activates. The hopper loader does not stop.

Note: When operating in this mode, the ***Er. 2*** error message displays at startup or after material changes. To clear the error code and silence the alarm, if installed, press the **Clear** key combination by pressing **and holding** both the CLEAR **UP** key and **DOWN** key together simultaneously.

- **enable** a customer-supplied auxiliary proximity switch (***1***)

  This proximity switch is typically mounted low in the machine bin below the hopper loader, and is wired into the hopper loader as shown in Figure (14). When enabled in this mode, the hopper loader fills the machine bin below it, then stops operation.

  Operation does not resume until the auxiliary proximity switch senses that the material level has dropped below the proximity switch. The hopper loader then refills the machine bin.

- **disable** a customer-supplied proximity switch (***0***).

  Set this parameter to ***0*** if you aren't using an auxiliary proximity switch or if you won't be disabling an installed auxiliary proximity switch.

Menu 8 *SPI Communication Enable*

Enable/Disable, Default = Disable (0)

The SPI Communication Enable menu lets you:

- **enable** the SPI communication function (***1***) if the hopper loader has the SPI communication option installed and is on an SPI network
- **disable** the SPI communication function (***0***) if the SPI option is installed, but the hopper loader is not currently on an SPI network

5-12 Shutting Down the Hopper Loader using the Series One Plus Controller

- Press the S START/STOP **START/STOP/SELECT/SET** key to stop the hopper loader.

For maintenance or for a long-term shutdown, **unplug the unit from the power source** and shut off the compressed air supply.

Chapter 6: Series One Plus SPI Communications

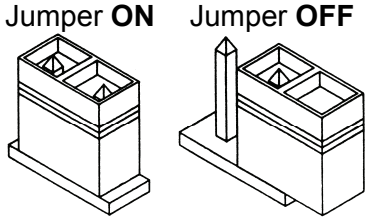
6-1 SPI Network Functions

The Series One Plus controller equipped with the SPI communications option lets you operate the controller on a network con-forming to Version 3.01 **or later** of the SPI protocol specification.

When installed on an SPI network, SS/CS Series hopper loaders, as well as other auxiliary processing machines, can be controlled by an injection molding machine (IMM) or an operator at the IMM controls. Two (2) SPI interchangeable communication ports are provided for easy connection into any daisy chain-type SPI network.

Series One Plus controllers with the SPI option support all required parameters of an SPI network, and some of the "non-required" parameters, too. The supported parameters are:

- Echo (system use only)
- Version
- Status, process
  - Processing flag
  - Low material alarm (with auxiliary proximity switch installed)
  - High vacuum alarm (central system units only)
  - No Convey alarm
- Mode, material
  - Machine on/off
  - Alarm acknowledgment
- Set point, Material A load time
- Set point, Material B load time
- Blanket poll (system use only)



Remember to **properly terminate the first and last units on an SPI network**. If the Series One Plus controller is the first or last unit in the daisy chain, ***terminate the transmission line*** by placing the jumper **on JMP1** as shown here.

6-2 Setting Up the SPI Function

You'll need to set several Series One Plus controller parameters before network communication can occur. These parameters are set in **expanded service menus**.

To gain access to expanded service menus, **disconnect and unplug** the SS/CS Series hopper loader, open the control box, and place a jumper across the **SERVICE** pins. Close the box and re-apply power. You now have six (6) additional menus available; three (3) of these menus are related to SPI operation.

Menu 8 *SPI Enable/Disable & Loopback Test*

Range = 0 to 1, Default = 0

When the expanded service menus are enabled, an additional parameter becomes available on this menu. Set this parameter to ***1*** to enable SPI communications. Set it to ***2*** to perform an internal self test. ***Disconnect all communication cables before performing the internal self-test;*** no loopback cable is needed.

> ***Note:*** To exit the self-test, you'll need to perform a complete reset: reapply power to the control while pressing both the **UP** key and **DOWN** key together simultaneously. All parameters reset to the factory defaults so **make a note of the parameter settings** you want to retain.
>
> If the Series One Plus screen alternates displays of the numbers ***85*** and ***170*** , a self test is successful. This condition continues until you do a complete reset. During the test, the number ***85*** continuously transmits out the port. When the controller receives an ***85***, it echoes a ***170***.

Menu 9 *SPI Address*

Range = 32 to 254, Default = 32

Each auxiliary device on an SPI network must be assigned a unique address to identify it to the IMM controlling the network. **Do not assign the same address to any two auxiliary machines** on the network, or line contention will occur.

Menu 10 *SPI Baud Rate*

Range = 300 to 19,200 bps, Default = 4,800 bps

The baud rate in bits per second (bps) is the data transmission rate. ***All units on the network must be set at the same baud rate.*** In general, this rate should be set to the fastest common speed available to the controllers on the network where satisfactory communication occurs.

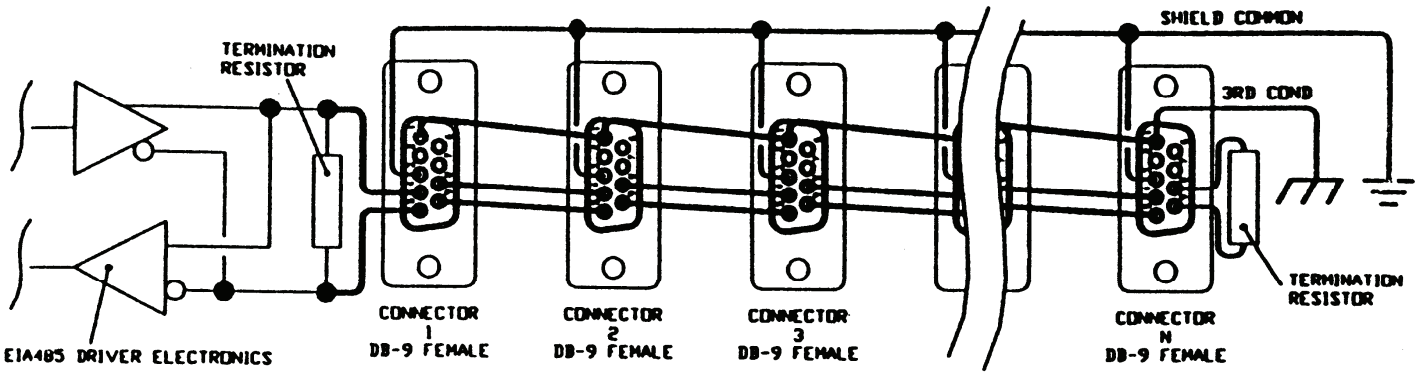
6-3 Operating under SPI Control

If you enabled the SPI function by setting the Menu ***8*** set value to ***1***, and you press the SCROLL **SCROLL** key, the screen displays ***SPI*** instead of displaying vacuum time. All control is now through the SPI network, and your SS/CS Series hopper loader now operates as instructed by the IMM control.

Press the START/STOP **START/STOP/SELECT/SET** key to view vacuum time, blowback pulse settings, proportioning percentage, and batch count. *SPI is still in control,* so return the display to ***SPI*** **before** leaving the machine unattended.

You can stop the Series One Plus controller in the normal manner by pressing the START/STOP START/STOP/SELECT/SET key, *but it may restart at any time* if so instructed by the IMM control. To avoid this condition, press both the CLEAR UP key and DOWN key together simultaneously while the screen displays *SPI*. This disables SPI communication. To re-enable, set Menu *8* set value to *1*.

Figure 11
Typical SPI Network Wiring Diagram



Chapter 7: Maintenance

7-1 Routine Maintenance

Cleaning Filters

Check the condition of the filter frequently until you can determine a filter-cleaning interval. Units conveying dusty or fine materials need more frequent cleaning. Note that a clogged filter can cause the discharge flapper valve to stay open, critically reducing overall system effectiveness. The discharge flapper valve requires proper venting; a clogged filter prevents proper flapper valve operation.

Replace the filter if it shows any signs of wear. You can obtain replacements and spares from the manufacturer.

To gain access to the filter, release the cover latches and lift the hopper/lid assembly off, grasping the lip of the cover.

! CAUTION

Do not lift the cover assembly by the motor, piping, or accumulator.

These components are not designed to support the assembly.

Checking Flex Hose for Wear

Worn hose reduces conveying rates. Check the hose regularly.

Inspect Material Discharge Valves

Look for signs of wear, improper operation, or material obstruction. Make sure that the flapper discharge valve is secure and free from all obstructions.

Note: SS/CS Series hopper loaders that convey very abrasive and/or very dusty materials may require more frequent maintenance.

7-2 Replacing Motor Brushes

Note: Make sure that you replace motor brushes **before** the brush shunt touches the commutator. Replacements and spares are available from the manufacturer.

SS/CS Series hopper loader vacuum motor brushes require periodic replacement. Maintain a supply of motor brushes, and establish a preventive maintenance program to reduce downtime.

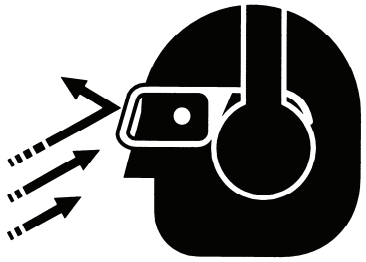
Make sure that you **properly seat replacement brushes** to achieve maximum service life. Unseated brushes may fail prematurely and increase your maintenance workload.

! WARNING

HAZARDOUS ELECTRICAL CURRENT PRESENT.
Secure the machine *BEFORE* servicing!

WEAR SAFETY GLASSES *BEFORE* performing this procedure!

Use a stable platform if working above floor level.



Removing Old Motor Brushes

1. If you haven't already done so, disconnect the hopper loader from the electrical supply!
2. Disconnect motor and blowback connection receptacles at the control enclosure.
3. Release the latches that secure the cover assembly. Lift off the cover assembly by the edges.
4. Remove the motor from the cover assembly by carefully releasing the springs. Springs are under tension, so be very careful!
5. Remove the brush end cap, then the two brush clips from the brush holder.
6. Remove the two brushes from the brush holder, and replace with new brushes.

Replacement and Reassembly

1. Re-attach the brush clips and the end cap after you make sure that the brush assembly is properly seated.

   Following steps 5 and 6 above, perform the same procedure for the opposite side.

2. Remove the armature assembly at the top portion of the hopper loader to properly seat the replacement brushes.
3. Insert a strip of 600-grit sandpaper with the rough side facing the brush.
4. Release the brush and rotate the commutator back and forth by hand (See the alternative seating procedure on the facing page) so that the brush is sanded to match the arc of the commutator.
5. In older motors, the wear of the brushes creates a shallow trough in the commutator. Sand the brush to conform to the contour.
6. Remove the sandpaper, and repeat steps 5 and 6, as needed until all brushes are replaced.
7. Reinstall the armature assembly.

Seating Motor Brushes

You have two (2) options for seating motor brushes (Steps 5 to 11):

Option 1

- Run the SS/CS Series hopper loader at 50% to 75% voltage for about 30 minutes.
- Apply power from a variable transformer at the motor disconnect, not at the control box.

Option 2

- Connect two (2) SS/CS Series hopper loader motors in series and run them for about 30 minutes.

! WARNING

On motors using white AMP disconnects, make sure power is not applied to the green ground wire; otherwise, the motor housing becomes electrically "hot."

Reducing line voltage may be accomplished by using a variable transformer or by connecting two identical motors in series.

-Notes-

Figure 12: Typical SSL/CSL 03 Series Hopper Loader - Exploded View

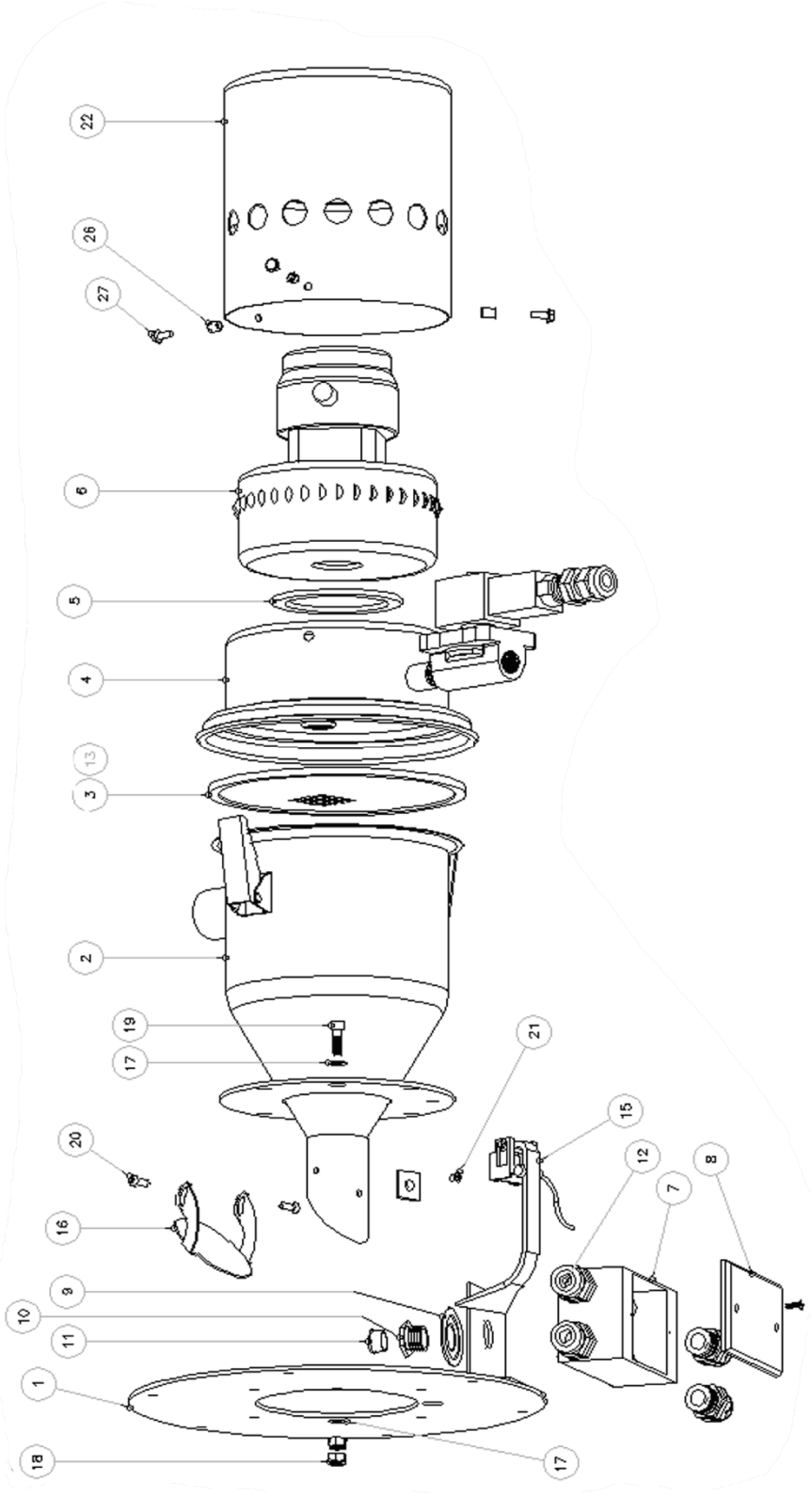


Figure 13: SSL/CSL 03 Series Hopper Loader Parts List

Refer to Figure 12 on the previous page for parts location.

Item	Quantity	Part no.	Description
1	1	A0556521	FLG, MT, ADPT
2	1	A0553741	CONE, WELD, 6" ID, SSTL
3	1	A0556534	FLTR, FLAT, CLOTH, 6" OD
4	1	A0556513	CVR, WELD, 6" ID, SSTL
5	1	A0541543	GSKT, SILC, SGLS
6			SEE VOLTAGE OPTIONS
7	1	A0541036	BOX, GANG, SGL, 4X2X2, UL
8	1	A0541037	BOX, GANG, SGL, CVR, BLNK, GSKT
9	1	A0003254	WSHR, REDUC, 75˚ X .50" STEEL
10	1	A0003217	CDUT, NIP, ½" REGAL, #791
11	1	A0548359	PLUG, HEYCO, BLK, 5/B, #2663
12	3	A0541039	CORD, GRIP, ½", .270-.480 #3231
13	1	A0556820	GSKT, U-CHNL, N PRN, .38 X .20 X .05W
14	1	A0541038	BOX, GANG, PLU, ½" NPT, UL
15	1	A558805	SW, ASSY, NC, LVL SNSR
16	1	A0558503	FLAP, DISCH, SS
17	4	W00002373	WSHR, FLAT, WI 3/16", 100 PCS/3
18	2	W00016426	NUT, STOP, ¼-20, PLD
19	2	A0553718	SCR, SHC, SS, ¼-20 X ¾
20	2	A0556622	SCR, CAP, HEX, SOC, HD, 10-32X 1/2
21	1	A0559402	SCR, FLAT, CSLINK, 10-32X3/8, NYLOC
22	1	A0556544	CVR, SHRD, MTR
23	1	A0555771	NIP, S.S. 3/8" X 1˚ CLS
24	1	A0555770	NIP, S.S. 3/8" 3˚ LONG
25	1	A0555769	FTG, SS304, EL, 90, 3/8
26	3	A0533900	NUT, RIVET, STL, 1D-32, FLUSH
27	10	W00017594	HOSE, FLEX, CLR, VINYL, 1.5"
28			SEE VOLTAGE OPTIONS
29	2	W00001917	CLP, HOSE, DIX332, 1.56-2.50
30	1	A0560901	FLTR, SRL/I-1.0, POLY, FELT, GLAZED
31	1	A0505648	GROM, BLK, 0.5625X0.25X
32	1	A0533933	PICK, MATL, AL, SGL TUBE 1.5"
33	7	A0536966	CONN. WIRE NUT, IDEAL #AO-A1
115 VAC Options			
34	.16	A0535193	TBG, HTSHRNK, 0.75ID, O.81 OD, 48" L
6	1	A0544850	MTR, 115V,2-STG,LAMB,11B212-00
36	1	A0544850	ASSY,CNTRL,SER 1,115
37	1	A0555792	SPLC, BUTT, PANDUIT, #PSN 16-M
28	1	A0556547	VLV, SOL, 3/8", #JSF8210G1, 120V
39	1	A0558085	CORD, CONN, FEMALE, 33" GRAY
40	1	A0558086	CORD, CONN, MALE, 9", GRAY
41	1	A0556087	CORD, CONN, MALE, 33" BLACK
42	1	A0558088	CORD, CONN, FEMALE, 9", BLACK

Figure 13: SSL/CSL 03 Series Hopper Loader Parts List (Continued)

230 VAC Options			
34	.16	A0535193	TBG, HTSHRNK, 0.75ID, 0.81OD, 48”L
6	1	A0542190	MTR, 230, 2-STG, LAMB, 116125-01
36	1	A0544851	ASSY, CNTRL, SER, 1.230
37	1	A0555792	SPLC, BUTT, PANDUIT, #PSN16-M
28	1	A0556608	VLV, SOL, 3/8”, #JSF8201G1, 240/60
39	1	A0559414	ASSY, CORD, BLACK, FEMALE, 9” LONG
40	1	A0559415	ASSY, CORD, BLACK, MALE, 33” LONG
41	1	A0559416	ASSY, CORD, GRAY, FEMALE, 33” LONG
42	1	A0559417	ASSY, CORD, GRAY, MALE, 9” LONG

Figure 14: Typical SSL Series Hopper Loader, Version 1 – Exploded view

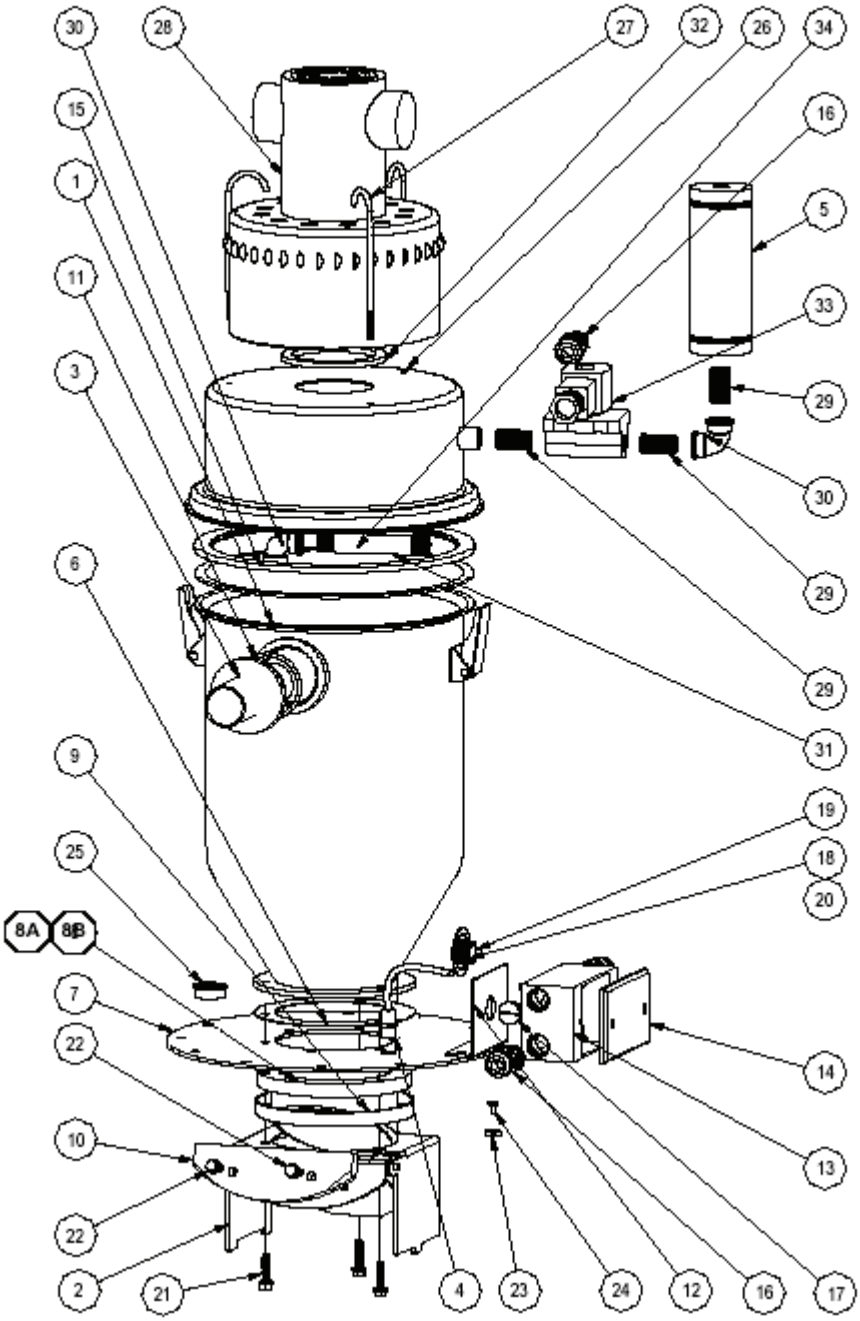


Figure 15: Typical SSL Series Hopper Loader Parts List, Version 1
Refer to Figure 14 on the previous page for parts location.

Item	Model No.	Quantity	Part no.	Description
1	SSR/SSL11	1	A0563505	CONE, WELD, 9" DIA.
2	SSR/SSL	1	A0563536	ASSEMBLY, FLAP/SUPPORT
3	SSL 06-11	1	A0556504	TUBE, INLET/OUTLET, 1-1/2"
4	SSR/SSL	1	A0563514	SWITCH, REED, MAG, SPDT
5	NPT	1	A0560919	ACCUMULATOR, 3/8"
6	SSR/SSL	1	A0563513	GASKET, THROAT, SEAL, FIBER
7	SSR/SSL	1	A0563510	FLANGE, 12" DIA., MOUNTING, MLD THROAT
8A	SSR/SSL	1	A0563517	THROAT, 4" DIA., SILC
8B	SSR/SSL	1	A0563543	THROAT INSERT, 4", SS
9	SSR/SSL	1	A0563520	RING, 4" THROAT, SS
10	SSR/SSL	1	A0563512	WEIGHT, 4" FLAP VALVE
11	SSR 06-11	1	A0553728	O RING, SILICONE, 2.234 IDX 0.139CS
12	SSR/SSL 06-45	1	A0563516	BRACKET, J BOX
13	4 X 2 X 2	1	A0541036	BOX, SINGLE GANG
14	4 X 2	1	A0541037	COVER, BOX, SINGLE GANG
15	SSR06-11	1	A0556821	GASKET, D CHANNEL, 10" DIA.
16		1	A0541039	CORD GRIP, ½", 0.170-0.430
17	NPT	1	A0541038	PLUG, BOX, GANG, ½"
18		1	A0003254	WASHER, REDUCER, .75' X .5"
19	NPT	1	A0003217	NIPPLE, CONDUIT, ½"
20		1	A0548359	PLUG, NYLON, 5/8"
21		3	A0563700	SCREW, ¼" 20 X 1 , HEX, SER, FLANGE
22		2	A0563701	SCREW, ¼" 20 X ¾ , HEX, SER, FLANGE
23		1	A0563515	MAGNET, REED SWITCH ACTUATOR
24		1	A0563703	RIVET, 1/8" CLOSED, DOME HEAD
25	SSR/SLC	1	A0563533	VENT, LOUVER, 1" DIA.
26	SSR LOADERS	1	A0556514	COVER, 9" ID SSTL, CSL 06-11
27		3	A0556517	BOLT, J, 10-32 X 5.25L
28		1	W00020081	MOTOR, VACUUM, 120 VAC, 3 STAGE
29	SSTL	3	079.030100.00	FITTING, NIPPLE, 3/8" CLS.
30	SSTL	2	083.00303.00	FITTING, NIPPLE, 3/8" ELBOW
31	SSTL	1	A0555772	FITTING, NIPPLE, 3/8" X 4"
32		1	A0541543	GASKET, SILICONE, 3.75 OD X .188 THICK
33		1	A0556547	VALVE, SOLENOID, 3/8", 115 VAC
34	SSL/SSIL06-11	1	A0565929	FILTER, POLY GLAZED
35		10 FT.	W00017594	HOSE, FLEX, 1.5", CLEAR VINYL
36		2	W00001917	CLAMP, HOSE, 1.5"-2.5"
37		1	A0533933	WAND, PICK UP, 1.5" ALUMINUM

Figure 14A: Typical SSL/CSL Series Hopper Loader, Version 2 - Exploded View

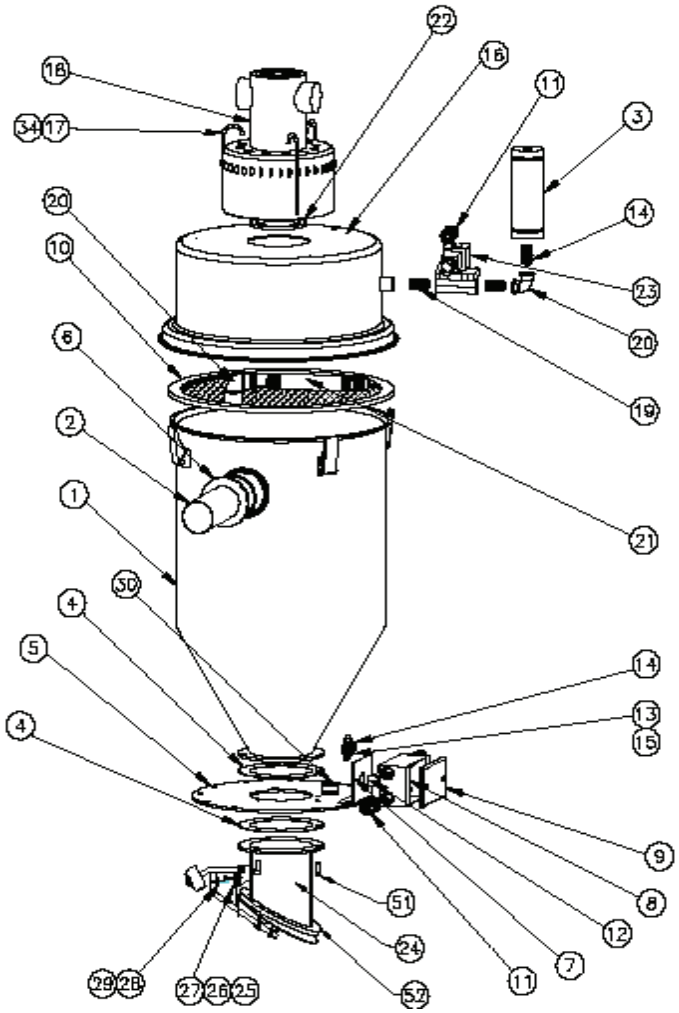


Figure 15A: Typical SLC Series Hopper Loader Parts List, Version 2
Refer to Figure 14 on the previous page for parts location.

Item	Quantity	Part no.	Description
1	1	A0563504	CONE, WELD, 9” DIA., SSR/SSL/CSL06
	1	A0563505	CONE, WELD, 9” DIA., SSR/SSL/CSL11
	1	A0535506	CONE, WELD, 14” DIA., SSR/SSL/CSL23
	1	A0563507	CONE, WELD, 14” DIA., SSR/SSL/CSL45
2	1	A0556504	IN/OUT, SSR 06-11. AL, 1.50
2	1	A0559449	INLET/POUTLET, 1 ½”, SSR 23-45
3	1	A0560919	ACCUMULATOR, 3/8” NPT
4	2	A0563513	GASKET, THROAT, SEAL, SSR/SSL/CSL
5	1	A0567621	FLANGE, MTG., 12” DIA., SSL/CSL 03-45
6	1	A0556546	ORNG, SIL, 3.234 ID. X 0.139 THK
7	1	A0563516	BRACKET, J BOX, SRC/SLC 02-16
8	1	A0541036	BOX, SINGLE GANG, 4 X 2 X 2
9	1	A0541037	COVER, BOX, SINGLE GANG, 4 X 2
10	1	A0565925	FILTER, SSL/CSL/ I-02/04, POLY, GLAZED
10	1	A0565930	FILTER, SSL/CSL/ I-08/16, POLY, GLAZED
11	4	A0541039	CORD GRIP, ½”, .0.120 – 0.470
12	1	A0541038	PLUG, BOX, GANG, ½” NPT
13	1	A0003254	WASHER, REDUCER, .75” X .5”
14	1	A0003217	NIPPLE, CONDUIT, ½” NPT
15	1	A0548359	PLUG, NYLON, 5/8”
16	1	A0556514	COVER, WELD, 9” ID SSTL, SSL/CSL06/11
16	1	A0565254	COVER, WELD, 14” ID SSTL, SLC23/45
17	3	A0556517	BOLT, J, 10-32 X 5.25L
18	1	W00020081	MOTOR, VACUUM, 115V
	1	W00020082	MOTOR, VACUUM, 230V
	1	W00020083	MOTOR, SPARE BRUSHES, 115V
	1	W00020176	MOTOR, SPARE BRUSHES, 230 V
19	3	079.03010.00	FITTING, NIPPLE, 3/8”, CLS., SSTL
20	2	083.00303.00	FITTING, NIPPLE, 3/8”, ELBOW, SSTL
21	1	A0566970	FITTING, NIPPLE, 3/8” X 6”, SSTL, SSR23-45
22	1	A0541543	GASKET, SILICONE, 3.75 OD X .188 THICK
23	1	SEE CHART	VALVE, SOLENOID, 3/8”
24	1	A0567620	ASSEMBLY, 4” ANGLED THROAT S.S, SSL/CSL 02-16
25	1	A0533925	SWITCH, REED, MAG, NO
26	2	A0567628	SCREW, BTNHD PHILLIPS, #6-32 X ½ LG. S.S
27	2 FT.	W00000890	HOSE, RUBBER, BLK, ¼” X 1/16”
28	1	A0533924	MAGNET CERAMIC
29	1	A0567627	SCREW, FLTHD, PHILLIPS, #6-32 X ½” LG. S.S
30	1	A0567624	VENT, LOUVER, 2” DIA. SSR/SSL/CSL
31	10’	W00017594	HOSE, FLEX, 1.5”, CLEAR VINYL
32	2	W00001917	CLAMP, NOSE, 1.5” – 2.5”
33	1	A0533933	WAND, PICK UP, 1.5” ALUMINUM
34	3	A0069197	NUT, STOP, PLD, 10/32
45	2	A0003215	CA, TIES, STD, 75” BUNDLE, 18#
46	1	W00018618	SCR, 10-32 X ½” , SELF TAPPING
47	7.5”	A0102623	WIRE, 600V, GRE/YLW, 18GA
48	1	A0535118	TBG, NPRN, 80-DUR, 5.O” OD X 0.94 WALL
49	1	A0535193	TBG, HTSHRNK, 0.75 ID, 0.81 OD, 48” L
50	2	A0003236	FEMAL SPADE TERM—SIZE 14
51	3	W00017962	SCR, SHC, ¼-20 X 5/8, W/PATCH

GASKET SELECTION

Item	Quantity	Part no.	Description
52A	1	W00012559	GSKT, THRT, EPT, BLACK, 4", STD TEMP
52B	1	W00018024	GSKT, THRT, SILICONE, ORANGE, 4", HI-TEMP
52C	1	W00016136	GSKT, THRT, NEOPRENE, WHITE, 4", STD, TEMP (FDA)

Figure 16: Typical SSIL/CSIL Series Sight Glass Hopper Loader - Exploded View

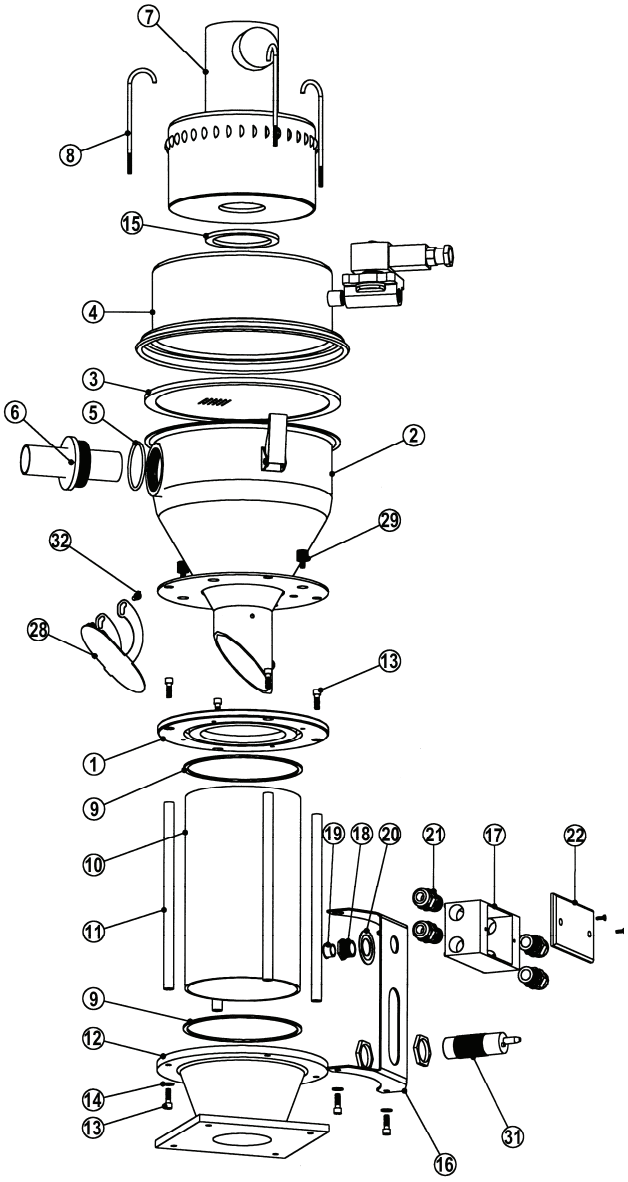


Figure 17: SSIL/CSIL Series Sight Glass Hopper Loader Parts List

Refer to Figure 16 on the previous page for parts location.

Item	Model no.	Quantity	Part no.	Description
1.	SSIL/CSIL03	1	A0553717	PLATE, MACH, TOP, ALU, SRI/IL03
	SSIL/CSIL06/11	1	A0553725	PLATE, MACH, TOP, ALU, SRI/IL06/11
2.	SSIL/CSIL03	1	A0553741	CONE, WELD, 6” ID, SSTL, SSR03
	SSIL/CSIL06	1	A0553742	CONE, WELD, 9” ID, SSTL, SSX06
	SSIL/CSIL11	1	A0553743	CONE, WELD, 9” ID, SSTL, SSX11
3.	SSIL/CSIL03	1	A0556531	FILTER, FLAT, WIRE, 6” OD, SSR/I03
	SSIL/CSIL03	1	A0556822	GASKET, U-CHANNEL, NEOPRENE, .38 X .20 X .06 W
	SSIL/CSIL06/11	1	A0556535	FILTER, CLOTH, 9” OD, SSL/CSL/IL06/11
4.	SSIL/CSIL03	1	A0556513	COVER, WELD, 6” ID, SSTL, SSR03
	SSIL/CSIL06/11	1	A0556514	COVER, WELD, 9” ID, SSTL, SSL/CSL/IL06/11
5.	SSIL/CSIL06/11	1	A0553728	ORNG, SIL, 2.234 ID X 0.139 THK
6.	SSIL/CSIL06/11	1	A0556504	TUBE, IN/OUT, 1.5”, SSX06/11
7.	SSIL/CSIL03	1	A0556544	COVER, SHROUD, MTR, SSL/CSL/IL01
	SSIL/CSIL03	1	A0542189	MOTOR, 115 V, 2-STG, LAMB, 116212-00
	SSIL/CSIL06/11	1	W0020081	MOTOR, 120 V, 3-STG, AMETEK-IS14787
8.	SSIL/CSIL06/11	3	A0556517	J-BOLT, 10-32 x 5.25L, SSL/CSL06-45
9.	SSIL/CSIL03	2	A0553714	GASKET, BODY, SIL, SSI/IL03
	SSIL/CSIL06/11	2	A0553722	GASKET, BODY, SIL, SSI/IL06/23
10.	SSIL/CSIL03	1	A0553727	SIGHT GLASS, PYREX, SSI/IL03
	SSIL/CSIL06/11	1	A0553726	SIGHT GLASS, PYREX, SSI/IL06/23
11.	SSIL/CSIL03	4	A0553715	SUPPORT ROD, BODY, ALU, SSI/IL03
	SSIL/CSIL06/11	4	A0553723	SUPPORT ROD, BODY, ALU, SSI/IL06/23
12.	SSIL/CSIL03	1	A0553712	BASE, MACH, BODY, ALU, SSI/IL03
	SSIL/CSIL03	2	A0553728	ORNG, SIL, 2.234 ID X 0.139 THK
	SSIL/CSIL03	1	A0553710	BASE, MACHINE MOUNT, THRT, SSI/IL03
	SSIL/CSIL06/11	1	A0553720	BASE, MACH, BOCY, ALU, SSI/IL06-23
13.	All	8	A0553718	SCREW, SHC, SS, 1/4-20 x ¾
14.	SSIL/CSIL06/11	4	W0002373	FLAT WASHER, WI, 3/16”, 100 PCS/#
15.	All	1	A0541543	GASKET, SILC, SGLS, MVH01X
16.	SSIL/CSIL03	1	A0553713	BRACKET, JBOX/PROX, ALU, SSI/IL03
	SSIL/CSIL06/11	1	A0553721	BRACKET, JBOX/PROX, ALU, SSI/IL06-23
17.	All	1	A0541036	BOX, GANG, SGL, 4 x 2 x 2, UL WETLOC
18.	SSIL/CSIL03	1	A0003217	CDNUT, NIP, 1/2”, #CN 50
	SSIL/CSIL06/11	1	A0003217	CDNUT, NIP, 1/2”, REGAL #791
19.	All	1	A0548359	PLUG, HEYCO, BLACK, 5/8, #2663
20.	All	1	A0003254	REDUCTION WASHER, .75” X .50” STEEL
21.	All	5 / 2	A0541039	CORD, GRIP, 1/2”, .270-.480 #3231
22.	All	1	A0541037	BOX, GANG, SGL, CVR, BLNK, GSKT
28.	SSIL/CSIL03	1	A0556503	FLAP, DISCHARGE, SS, SSR03
	SSIL/CSIL06/11	1	A0553731	FLAP, DISCHARGE, SS, SSXX06-11
29.	All	2	A0556529	SCREW, RTRCT, 1/4-20, SCO #47116220
31.	All	1	A0542138	PROXIMITY SWITCH, 115 VAC, KI-2015-BBOR/NI
			A0556548	PROXIMITY SWITCH, 24 VDC, KI-3015-FNKG/NI
32.	All	2	A0556822	CAP SCREW, HEX,SOC, HD, 10-32X ½

Figure 18: Typical SSIL/CSIL 03 Series Sight Glass Hopper Loader – Exploded View

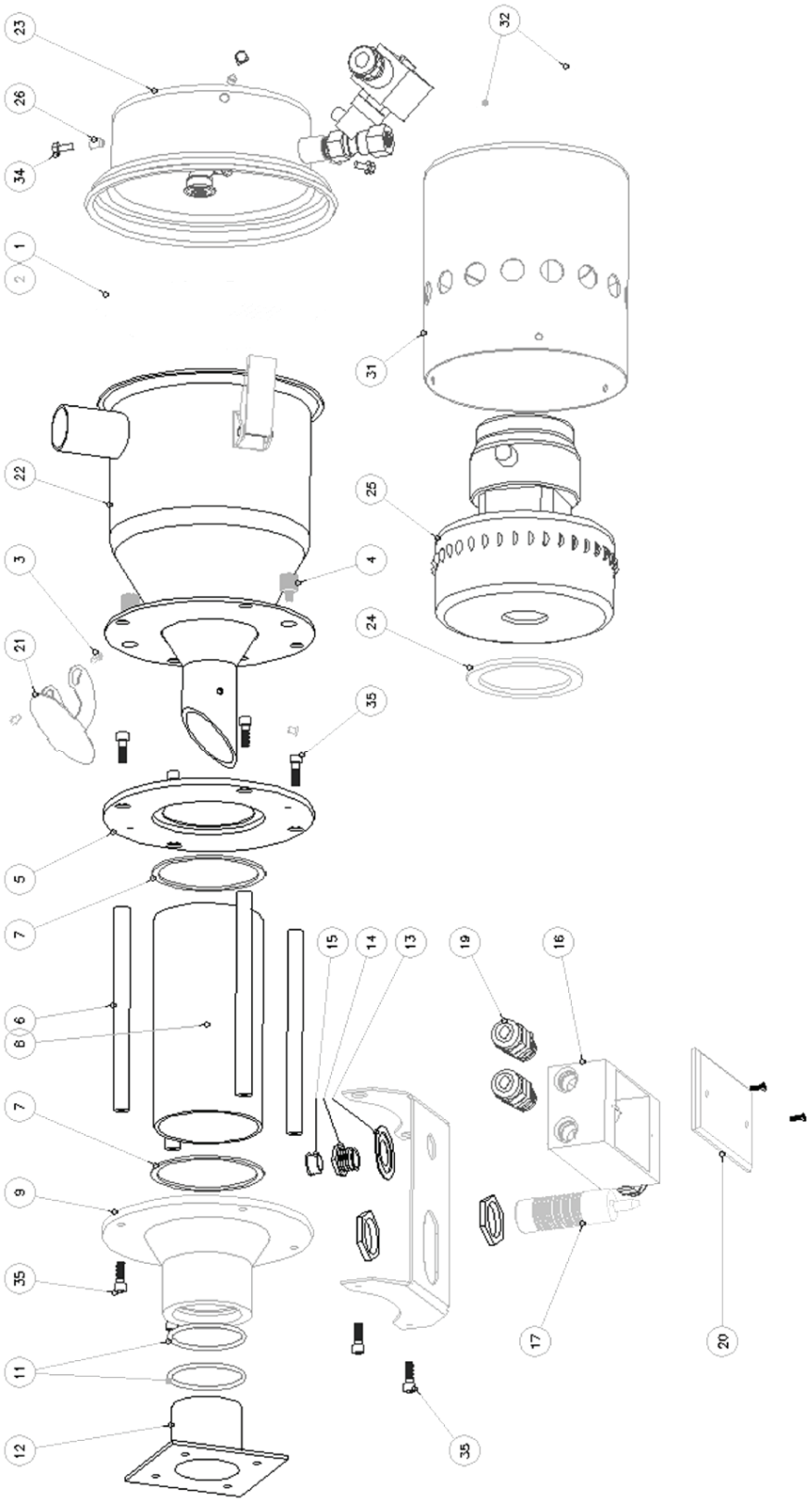


Figure 19: SSIL 03 Series Sight Glass Loader Parts List

Refer to Figure 18 on the previous page for parts location.

ITEM	QTY	PART NO.	PART DESCRIPTION
1	1	A0556531	FLTR, FLAT, WIRE, 8" OD
2	1	A0556820	GSKT, U-CHNL, NPRN, .38 X .20 X .06 W
3	2	A0556822	SCR, CAP, HEX, SCC, HD, 10-32 X 1/2
4	2	A0556529	SCR, RTRCT, ¼-20, 500 # 471162210
5	1	A0553717	PL, MACH, TOP, ALU
6	4	A0553715	ROD, SUPT, BODY, ALU
7	2	A0553714	GSKT, BODY, SIL
8	1	A0553727	GLAS, SIGHT, PYREX
9	1	A0553712	BASE, MACH, BODY, ALU
10	1	A0553713	BRKT, JBOX/PROX, ALU
11	2	A0553728	CRNG, 5IL, 2.234 ID X 0.139 THK
12	1	A0553710	BASE, MACH MOUNT, THRT
13	1	A0003254	RDUC, WSHR, .75" X .50" STEEL
14	1	A0003217	CDUT, NIPPLE, ½" 3CN 50
15	1	A0548359	PLUG, HEYCO, BLK, 5/8 #2663
16	1	A0541038	BOX, GANG, SNGLE, 4X2X2, UL
17	1	A0558548	SW, PROX, 30 MM, 24V, NO/NC, 3K15208
18	2	A0541038	BOX, GANG, PLUG, ½" NPT, UL
19	2	A0541039	CORD, GRIP, ½", .270-.480 33231
20	1	A0541037	BOX, GANG, SNGLE, COVER, BLNK, GSKT
21	1	A0556503	FLAP, DISCHARGE, SS
22	1	A0553741	CONE, WELD, 6" ID, SSTL
23	1	A0556513	CVR, WELD 5" ID, SSTL
24	1	A0541543	GSKT, SILC, SGLS
25	1	---	SEE OPTIONS
26	3	A0533900	NUT, RIVET, STL, 10-32, FLUSH
27	1	A0565770	NIP, 5.5, 3/8" X 3" LONG
28	1	A0585769	FTG, SS3D4, EL, 90, 3/8
29	1	A0555771	NIP, 5.5..3/3" X 1" CLS
30	1	A0556545	VLV, SOL, ASCO, 3/8", 8210G1, 115 V
31	1	A0556544	CVR, SHRD, MTR
32	2	W00018618	SCR, 10-32, SELF TAPPING
34	3	A0559418	SCR, MTR, SHRD, 10-32 X ½
35	8	A0553718	SCR, SHC SS, ¼-20 X 3/4

Chapter 8: Troubleshooting

SSL/CSL, SLC and SSIL/CSIL Series Hopper Loaders with Standard Series One Controllers

Problem	Possible cause	Solution
Hopper loader does not work.	No power to control box.	Plug in power cord. Check main disconnect.
	Power switch is off.	Turn ON control box.
	Fuse is blown.	Replace the MDL 10 fuse.
	The bin below the hopper loader is filled to capacity.	Unit resumes operation when the material level drops; *this is normal.*
	Fouled flapper discharge valve.	Remove obstruction; check for free movement of flapper assembly.
	Build-up on sensor arm.	Clean and readjust for material flow characteristics.
	Loose control wiring.	Secure all terminal connections.
	Blowback and motor connections are not secure.	Reattach blowback and/or motor connections.
	Power switch has failed.	Replace switch.
	Reed switch has failed.	Replace reed switch, adjust magnet.
	Circuit board has failed.	Replace circuit board.
Vacuum motor does not work.	The bin below the hopper loader is filled to capacity.	Unit resumes operation when the material level drops; *this is normal.*
	Motor assembly is not properly connected to the controller.	Plug motor assembly into the controller enclosure.
	Fuse is blown.	Replace fuse with an MDL 10 fuse.
	Motor requires servicing.	Repair or replace motor as needed.

SSL/CSL, SLC and SSIL/CSIL Series Hopper Loaders with Standard Series One Controllers *Cont'd.*

Problem	Possible cause	Solution
Blowback does not work properly.	Air pressure is too low.	Increase air pressure to at least 80 psi (551.6 kPa/5.52 bars).
	Air supply to blowback is restricted.	Make sure piping is full size.
		Remove all restrictions in air supply.
	Blowback valve assembly is not connected to controller.	Connect blowback assembly to controller at the proper receptacle.
	Control wiring connections are loose on the circuit board.	Secure terminal connections of the controller wiring on the circuit board.
	Solenoid valve or valve coil has failed.	Repair or replace solenoid valve as needed.
Hopper does not completely fill.	Material supply is low.	Refill material supply.
	Selected conveying sequence is too short.	Select a more suitable sequence from the 16 selections; see Section 4-4 on for more information.
	Material probe not properly positioned in material supply.	Adjust material probe at material pickup point.
	Material probe not adjusted for flow characteristics of material.	Adjust material probe to compensate for flow characteristics; see Section 3-8 for more information.
	Obstructions in supply line.	Clear all obstructions in the line.
	Filter is dirty.	Clean or replace filter as needed.
	Filter is clogged, holding open the flapper discharge valve.	Replace filter as needed.
Power light does not work.	Terminal connection is loose.	Secure terminal connections on the terminal board.
	Light is burned out.	Replace light.
	Wire has been cut.	Replace wire; replace light.
Hopper over-fills repeatedly.	The loading sequence is too long.	Select a more suitable sequence from the 16 selections; see Section 4-4 for more information.

SSL/CSL, SLC, and SSIL/CSIL Series Hopper Loaders with *Optional* Series One Plus Controllers

Problem	Possible cause	Solution
No LED display.	No power to control box.	Plug in power cord; check main disconnect.
	Power switch is off.	Turn ON control box.
	External fuse 1FU is blown	Replace fuse 1FU.
	Internal fuse FU2 is blown	Replace fuse FU2.
	TB1 is disconnected or loose.	Reconnect or tighten TB1.
	Ribbon cable to the display is loose.	Tighten ribbon cable; check both ends.
	Loose wiring in the control.	Check and tighten wiring.
	Circuit board has failed.	Replace circuit board.
AEC is displayed at power-up, but vacuum motor doesn't start when the S START/STOP **START/STOP/SELECT/ SET** key is pressed. The screen continues to display ***AEC***.	Bin full sensor reed switch is tripped.	Wait for machine bin material level to drop, then manually re-start the hopper loader.
	Misaligned bin full sensor reed switch magnet.	Realign magnet.
	Bin full sensor reed switch has failed.	Replace.
	Bin full sensor reed switch wiring is loose/disconnected.	Repair the wiring fault.
	TB2 is loose or disconnected.	Re-connect or tighten.
	Ribbon cable to the display is loose or disconnected.	Re-connect or tighten.
	Defective keypad.	Call the Service Department.
Control and display appear to operate normally, but the vacuum motor never starts.	Vacuum motor unplugged from the control.	Plug in the vacuum motor.
	Vacuum time is set to zero (0) on Menu ***1***.	Reset Menu ***1*** to an appropriate time.
	The vacuum motor has failed.	Repair or replace vacuum motor as needed.
	Solid-state relay has failed.	Replace.
	The circuit board has failed.	Call the Service Department.
Control and vacuum motor are operating normally, but the blowback cycle isn't working. The blowback solenoid clicks.	No or insufficient compressed air.	Fix compressed air supply. Connect to 80 psi (551.6 kPa/ 5.5 bars) supply.
	Restricted compressed air line.	Find and fix restriction.

SSL/CSL, SLC and SSIL/CSIL Series Hopper Loaders with *Optional* Series One Plus Controllers *Cont'd.*

Problem	Possible cause	Solution
Control and vacuum motor are operating normally, but the blowback cycle isn't working. The blowback solenoid makes no sound.	The blowback valve is unplugged.	Plug in the blowback valve cable.
	The number of blowback pulses on Menu 2 is set to zero.	Restore Menu 2 to an appropriate value.
	TB1 is loose or disconnected.	Secure TB1.
	Solenoid valve or its coil has failed.	Repair or replace as needed.
	The circuit board has failed.	Call the Service Department.
Hopper doesn't fill completely.	Material supply is low.	Fix material supply problem.
	Material wand is not properly positioned in material supply.	Adjust material wand at material pickup point.
	Material wand not adjusted for the flow characteristics of the material conveyed.	Adjust material wand to compensate for flow characteristics. See Section 3-6 for more information.
	Obstructions in supply line.	Clear **all** obstructions in the line.
	Filter is dirty.	Clean or replace filter as needed.
	Filter is clogged, holding open the flapper discharge valve.	Replace filter as needed.
	Vacuum time is set too low.	Set Menu 1 to an appropriate value.
Proximity switch trips before tank is full.	Material residue buildup on proximity sensor.	Clean proximity sensor.
	Proximity sensor sensitivity is set too high.	Reduce sensitivity of sensor.
	Material possesses excessive static properties.	Additional grounding is necessary. Contact the Engineering Department.
	Control wiring connections on circuit board are loose.	Secure connections on circuit board.
	Proximity sensor wire is cut.	Replace proximity sensor.

SSL/CSL, SLC and SSIL/CSIL Series Hopper Loaders with *Optional* Series One Plus Controllers *Cont'd.*

Problem	Possible cause	Solution
The screen displays the No Convey ***Er. 1*** error message.	Low material supply.	Replenish material supply.
	Material supply obstructed.	Clear all obstructions.
	Proximity sensor misadjusted.	Increase sensitivity of proximity sensor.
	Vacuum timer is set too low.	Set Menu ***1*** to an appropriate time.
The screen does **not** display the No Convey ***Er. 1*** error message when the material supply is empty.	Menu ***5*** is set to zero.	Set Menu ***5*** to ***1***, ***2***, or ***3***.
	The proximity sensor has failed.	Repair or replace proximity sensor as needed.
	Proximity sensor wiring loose.	Tighten the connector on TB2.
	PC board failure.	Contact the Service Department.
	Corrupted program.	See the last step of Section 5-10 for information on restoring factory settings.
No-Convey alarm triggers, but the material supply bin is full.	Pickup wand is not positioned properly in the material supply.	Adjust material probe.
	Dirty filter.	Clean or replace filter as needed.
	Proximity sensor is not adjusted properly for material being conveyed.	Increase sensitivity of proximity sensor.
	Material line has obstruction.	Clear material line of all obstructions.
	Convey distance exceeds vacuum time.	Set Menu ***1*** to a longer time.
	Motor requires service.	Repair or replace motor as needed.
	Buildup on flapper valve.	Clean and readjust for material flow characteristics.
Hopper over-fills repeatedly.	Proximity sensor sensitivity is not properly adjusted.	Increase sensitivity of the proximity sensor to match the characteristics of material being conveyed.
	Proximity sensor connections are loose.	Secure terminal connections.
	Proximity sensor has failed.	Replace proximity sensor.

SSL/CSL, SLC and SSIL/CSIL Series Hopper Loaders with *Optional* Series One Plus Controllers *Cont'd.*

Problem	Possible cause	Solution
The screen displays the ***Er. 2*** error message.	The customer-supplied auxiliary proximity switch is tripped because of a low material level in the machine bin.	Correct the material supply problem.
	An auxiliary proximity switch is enabled (Menu ***7*** set to ***2***), but one isn't installed.	Install an auxiliary proximity switch, or disable this feature by setting Menu ***7*** to zero (***0***).
The screen displays ***PLUS*** at power-up. Set parameters are not being retained.	Battery-backed RAM has failed.	See the last step of Section 5-10 for information on restoring factory settings.
The screen displays ***EEEE***.	PC board failure.	Call the Parts Department for service.
Proportioning valve doesn't shift. (PP models only).	No compressed air.	Connect to 80 psi (551.6 kPa/ 5.52 bars) air supply.
	Defective valve or solenoid.	Repair or replace as needed.
	TB1 loose or disconnected.	Tighten TB1 connections.
	Defective PC board.	Call the Service Department.
Only one material is conveyed during proportioning operation (PP models only).	Material supply problem.	Correct material supply problem. Replenish, move pickup wand, remove obstructions.
	Menu ***2*** is set to zero (***0***).	Set Menu ***2*** to the percentage of Material B you want.
No SPI communication (SPI-equipped models only).	Improper network cabling.	See Figure (5).
	SPI communication feature hasn't been enabled.	Set Menu ***8*** to ***1***.
	SPI baud rate is incorrect.	Make sure all networked equipment in the network are transmitting at the same baud rate.
	The unit address is incorrect or two units on the network have the same address.	Set each unit on the network to a unique address. The SS/CS Series hopper loader address is set on Menu ***9***.
The screen displays ***0*** when an internal test is attempted (SPI equipped models only).	The SPI option wasn't purchased with this unit.	Contact your sales representative to purchase an SPI-ready SS/CS Series hopper loader.
	PC board failure.	Call the Parts Department.
The screen displays ***HOLD*** (HOLD).	External input enabled not present.	Disable input, or supply same.

Technical Assistance

Parts Department

Call toll-free 7am–5pm CST [800] 423-3183 or call [262] 641-8610, Fax [262] 641-8653
The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

Service Department

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Contract Department

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Let us install your system. The Contract Department offers any or all of these services: project planning; system packages including drawings; equipment, labor, and construction materials; and union or non-union installations.

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